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ETC.:

A REVIEW OF GENERAL SEMANTICS

SPECULATIONS ON METHODOLOGY IN THE SOCIAL SCIENCES

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I dare say that I have worked off my fundamental formula on you that the chief end of man is to frame general propositions, and that no general proposition is worth a damn. O. W. HOLMES, JR.

THE MAIN SUBJECT of this paper is classification. The illustrations are drawn largely from anthropology or the physical sciences, the latter because the relative simplicity of their data makes some points clearer than corresponding matters in the social sciences. It is not suggested herein that all problems of science have been, or can be, solved merely by the application of a few rules of method; but a good methodology, while it can never in itself disclose matters of fact, can, on occasion, demonstrate that some of the problems that have concerned us are not problems in the sense that they arise from the data, but are rather logical chimeras, arising from the conceptual apparatus that was brought to bear upon the data. In order to make the exposition complete I will have to discuss some points that may seem childishly simple and obvious to the reader, but since this paper is meant to be a connected series of arguments, it is better to have these points stated explicitly, than to risk disagreement in conclusion from some shade of difference in assumptions that passed unnoted.

To begin with something apparently only distantly related to anthropology or the social sciences in general, what can the physical scientists tell us about the world in which we live?[1] I think it is fair to say that the physicist's description of reality these days seems to be in terms of *events*. That is merely to say that a physical description of atomic or subatomic phenomena tends to emphasize the point that reality takes place in time.

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[1] The assumption here and throughout is expressly materialistic, if by such a term you would designate the conviction that life, and life forms, including man, enjoy no 'extra-territorial' status with respect to nature's general laws.

As the older three dimensions defined a point, so now do the four dimensions define an event. Electrons, protons, neutrons, etc., may be thought of as events, or more precisely, the words usually stand for a certain probability that a particular kind of event will occur. Now it is clear that no two events can ever be completely similar, since they cannot have the same four coördinates. And it follows that neither can any two physical objects composed of these events be absolutely identical, one with another. I have brought up this matter merely to make a single point: *there is no such thing as absolute identity in the objective world.*

Now let us pass from the consideration of the physical object to the object as perceived. The object as perceived is less of a thing, for our purposes here, than a relationship.[2] By this I do not imply that the physical state during a sensation may not be a perfectly good scientific datum. I mean only that our awareness of an object is not uniquely determined by the object, but depends upon a certain relation obtaining between ourselves and the object and moreover on our general condition at the moment of perception. I realize that this is not an easy proposition in epistemology, but I think the formulation I have given here is sufficient for the methodological use I am going to make of the idea.

Now, we know that things are sometimes perceived alike and yet are not identical. This condition arises from the limitations of our senses, which report to us only a few of the complex characteristics of an object. We need not feel abused, however, that nature has not equipped us with a sensorium that would reveal the complex structure of everyday objects, for such a sensorium would make life unbearably complex, and certainly would not have been to the purpose of the animal from whom we inherited our senses. Our insectivorous progenitors had no occasion to inquire into the structure of amino acids; it was enough that they recognized the smell of their prey and acted accordingly. Nature in these matters behaves pragmatically, striving not for logical perfection, but for workable mechanisms.

The point is this: *in the act of perception we have already taken the first step in classification. Our senses lump together under the same perceptual image physical objects in no sense identical and convey to us only a limited number of the various characteristics of the object in what might seem a highly arbitrary selective process.*[3] But while we lose in precision by this process, we gain in simplicity, for, as I said above, a complete description of the simplest object would engage our attention for far longer than the object is worth to us, or indeed longer than we could last. We shall profit by this simplicity, however, only if we keep in mind that it was arrived at by a somewhat arbitrary selective process involving the characters to be reported on, and do not commit the error of supposing that the reality is, indeed, as simple as it seems. In this sense, then, our data come to us already classified once.

II

For the purpose of having the world simple enough to talk and to think about, however, it has been necessary for men

[2] Unless we wish to hold with Berkeley, *et al.* If one does hold to the position of the worthy Bishop, I know of no logical engine with which to eject him, but I think it is a sterile hypothesis for science.

[3] For example, our unaided sense of sight informs us that a solution of sugar will transmit light, but does not inform us that the planes of vibration of the light waves have been rotated somewhat in the transmission.

to make further classifications, for the classifications made by the senses are too numerous to be used in thinking and, inasmuch as the criteria for classification used by the senses are rather arbitrary, the senses often do not distinguish classes that it is useful to us to have distinguished. That the classification arrived at by the senses is as useful as it is, may, I suppose, be attributed to the force of natural selection and organic evolution. We frequently use instrumental aids in breaking down sensible classes (perceptions) into sub-classes, when it suits our purposes so to do. We then further classify by grouping these sensible or instrumental classes into larger groups, taking as our criteria for class membership certain similarities between the classes thus grouped. It is these groups that usually first attain to the dignity of a class name. Such a class name is our familiar common noun. Thus the name 'apple' designates a certain class of objects with some similarities and many differences between them. What we think about those similarities in such a class seems to me to be the crux of our methodological problem.

One theory about those similarities which has had great influence among philosophers and laymen alike was the theory to which Plato's name is attached. In Plato's eyes, the similarities between the members of a class and indeed the possibility of classifying in the first place were due to the existence of certain 'real' objects, the 'ideas.' Such an 'idea' represented the 'essential' part of an object—its 'essence.' It was the fact that all sensible apples, to follow our example, were, in more or less degree, copies of the 'ideal' apple that enabled us to recognize these objects as apples and to classify them accordingly. And further, in Plato's eyes, the real and significant portion of the apple was in those respects in which it was a copy of the 'ideal' apple, the other respects being 'accidentals' which were not significant from the point of view of knowing about apples or about reality, since these respects were 'not real.' This theory, which I think we may properly call a metaphysical theory, is not widely accepted today, yet its effects persist in our methodology to a surprising degree, as I mean to show further on.

I prefer to think about the similarity between objects in a class in psychological rather than in metaphysical terms. This is self-evident in the case of those classifications (perceptions) which are brought about by the limitations of the sensorium with which we come equipped. But the existence even of named classes may be assigned to psychological phenomena. In some cases the mechanism is clearer than in others. For example, the objects in a class, while in no sense identical, may serve the same human purpose, which could lead to their classification into the same class. I take this to be the mechanism which operated in the case of the class 'food for human beings.' Of course it is always possible to ask, 'What do the objects in this class have in common that makes them useful for the same purpose?' I suppose that one could answer that they all have to be metabolizable or at least harmless when ingested, and that this property has to be known to human beings (*viz.,* the class 'tomatoes' fulfilled the physiological requirements but did not become a member of the class 'food' until people became aware that they did). But notice that these criteria are meaningful only in relation to human beings. I think that to say that the essence of the objects in the class 'food' is their property of being useful to human beings is a rather anthropocentric point of view. It results from a

confusion of the objects in the class (which are real) with the class (which is conceptual). To continue to a *reductio ad absurdum*, I could perfectly well set up a class of 'objects to my left.' Such a classification might be useful to me, and propositions could be framed which would be true of all of the members of this class and of no non-members. But I am certainly not going to seek a metaphysical reason for this apparent unity.

When we have set up criteria for class membership, either explicitly or more often implicitly, we are able to group sets of sensory images into classes, on the basis of their having the characteristics to meet the criteria we have set up. Most people would go further, as I would, and postulate that there exist, independent of these images, physical objects, which, brought into a proper relation with the observer, acts as a necessary cause and partial determinant of the sensible image. Then, giving the class a name—what name is not important, being usually either arbitrarily or historically determined—we can use that name as a symbol in our thinking and communication, as an abbreviation for 'the objects that fulfill these (explicit) criteria.' In this way the process of classification becomes a powerful intellectual tool, but like all powerful tools, it is capable of causing the greatest destruction to our enterprises when improperly used.

III

Let us examine the use of a simple class, in this case with the class name 'sodium.' This name designates a particular set of atoms which have some things in common, but which, harking back to our previous argument, are in no sense identical. They differ among themselves in position, in velocity, in energy level, and in numerous other matters. How, then, if the objects, in this case the atoms, are so different, can we accomplish anything by using the class as a term in our thinking? The answer must take into account the process of classification. We define membership in the class 'sodium' by certain criteria respecting the behavior of the atoms to be admitted to the class. Then, in our thinking, we use the class name, as we said above, as an abbreviation for the 'class of atoms which behaves in this (explicit) way.' We know, then, that if we come upon atoms legitimately enjoying the title 'sodium' we can rely upon these atoms to behave in a certain way, for such are the criteria for membership in the class 'sodium.' It must be pointed out here that such a classification is useful to us only if we have it on good authority that some particular batch of atoms that we have at hand has been examined by persons familiar with the class criteria, and has been found to possess the necessary behavior for inclusion in that class. This is the only way a batch of atoms can get into the class 'sodium' as we are using the term here—as a means of predicting behavior and of communication — and notice that there is the human agency involved in the classifying. If we do not have the authority spoken of above, we have to examine the atoms for ourselves. The usefulness of classification in this instance is in transmitting to us the results of someone else's investigations. In this case, its usefulness depends on the criteria for class membership's being explicitly known to both parties in the communication.

The knowledge that a particular batch of atoms meets the class criteria for the class 'sodium' does not usually tell us all we need to know. It tells us nothing about where the batch of atoms is, which direction it was going when last seen,

at what energy level the individual atoms are, and numerous other matters of much practical importance. We do not ordinarily handle these matters by means of classification, however, though there is no reason why we could not, for example, have a class of 'sodium atoms on such-and-such a shelf,' but ordinarily we satisfy ourselves on these matters by direct inspection, as the use of classification for those matters which can be handled by direct inspection would be superfluous and would involve us in an unwieldy number of subclasses. Where we draw the line, however, between matters to be handled by classification and matters to be handled by direct inspection is in practice entirely determined by our convenience, and not by a consideration of what is 'essential' to the nature of sodium atoms, and what is 'accidental.' Nature knows no distinction between essence and attribute. That a sodium atom has a certain number of electrons in its shell and that it is travelling at a velocity of 1374 m.p.s. 137° 13′ 43″ from N. from a given point at a given instant in time are both matters which can function significantly in a causal sequence, which property, it seems to me, scientists might do well to adopt as a criterion of reality. Which of the several characters, the nature of the electron shell or the velocity of the body as a whole seems more important will depend on why one is interested in sodium atoms, but it must always be an anthropocentric judgment (and there is nothing *per se* wrong with that), and one should not be disappointed if nature does not appear to share his personal enthusiasms.

We have said above that having received some certified sodium atoms we could trust them to behave similarly within the limits of our class criteria. Can we trust them to behave similarly in other matters? Not necessarily. It is true that some characters which are used for class criteria are known to correlate so consistently that the correlation between them can be treated for practical purposes as plus 1.00. The discovery of such correlations is sometimes conceived as the main business of science. Sometimes these several characters correlate so consistently that we use one character of the group as an index for classifying—*i.e.*, we assume on the basis of past experience that since several characters have always correlated completely they always will. That we do so at our peril is shown again and again in the history of science, and indeed a considerable portion of our scientific work is devoted to looking for more criteria for classification and to a continual confirmation of the correlations, just for the sake of safety.

We were discussing to what extent objects that were members of a particular class could be trusted to behave similarly. In the case of the members of the class 'sodium' there are several chemical reactions which correlate so consistently that we can, in practice, use any one of these reactions as establishing class membership, that is, as being evidence that the atoms exhibiting those reactions will behave as specified in the class criteria for 'sodium.' If, however, we put our sodium atoms into a mass spectroscope, we discover that our chemical criteria did not distinguish several kinds of atoms which behave quite differently in the mass spectroscope and are, in the mass of their nuclei, indeed quite different. I cannot refrain from anticipating my argument here and mentioning that should a chemistry student, imbued with the spirit of Platonic metaphysics, ask the physical chemistry professor which of these several nuclear masses identified the isotope and which the *real* sodium, I fear that he

would tax the patience of that dignitary unwisely.

The points that I have been at such unconscionable length to make, then, can bet set forth as follows:

1. Classification, including the naming of classes, simplifies discourse by subsuming under one name a number of ideas.

2. The objects in a class are not identical.

3. We can know that objects are members of a class only if we know that some one has compared each of the objects with the class criteria.

4. Class criteria are arbitrary.

5. The knowledge that an object is a member of a class is useful to us in predicting the behavior of that object in those matters enumerated in the class criteria.

6. Common class membership does not guarantee similarity of behavior of the objects in a class with respect to matters not specifically enumerated in the class criteria.

7. Sometimes such high correlations are discovered between behavior characteristics used as class criteria that the presence of any one of these characters is taken to guarantee the behavior of the class members with respect to the other criteria. Such correlations must be established empirically.

8. The act of defining a class by several characters does not establish a correlation between those characters.

9. The act of defining a class does not establish that that class does or can have members.

10. Common nouns are names given to classes.

11. When the class criteria have been stated, no knowledge about the objects in a class is gained by giving the class a name.

IV

So far I have discussed classification from a fairly practical standpoint. I have inquired as to how classifications came about and how they were useful to us. I have mentioned how classification serves as a sort of intellectual short hand, dependent for its usefulness on the class criteria's being explicitly known to both parties in the communication. Now, to bring up a new point, let me take a fresh example. Suppose a scientist needs a means of measuring electrical potential. He can look in the catalogue of a scientific supply company and find devices described in essentially the following terms: 'This apparatus measures electrical potential in these (specified) units, within this (specified) range, and with this (specified) degree of exactitude.' This tells the scientist what he needs to know. It tells him what he may expect of the object. It tells him how the object behaves. He knows nothing more about the object when he knows that it belongs to a class named 'Weston Voltmeter No. 0000-A' although this knowledge may facilitate his dealings with the clerk at the supply company.

Let us go back to the question of how one can find out what an object *really is*. Such questions confront students in the social sciences, anthropology particularly, from time to time. They are asked to consider what culture *is*, or whether the communication between gibbons is *really* language, as if it were some sort of scientific conundrum, to be solved by a display of logical or etymological virtuosity. In the system I am presenting here, no time could be wasted in such discussions. If the criteria for class membership are explicit and the specimen in question is available for inspection then the question can be settled unambiguously. What I am arguing here is that

since the class criteria are arbitrary, we had just as well make them explicit, for they will be no less arbitrary, or unnatural, for being vague. Herein, of course, is the basic difference between this system and the Platonic system. In this system the class criteria are arbitrary and nothing is added to knowledge by knowing the class name that was not known when the class criteria were stated. In Plato's system something is added when the class name is known. What is added is the identification of the Platonic 'idea' of which the object is an imperfect copy. Plato's system works just the opposite of the system I am describing herein —and granted Plato's postulate, it is perfectly correct in so doing. If one is willing to make Plato's postulate—that the 'ideas' exist, that sensible objects are but imperfect copies of those ideas and real only insofar as they do copy the 'idea'—then it does make sense to begin a consideration of an object with attention to the name, and to seek to deduce the class criteria from the name. Given the Platonic 'idea' to define, say, the class 'language,' it does make sense to spend time worrying over such questions as 'Is the communication between gibbons *really* language?' because one believes that he has a touchstone to determine criteria for inclusion in that class. But unless one is willing to postulate the existence of Plato's 'ideas,' the question of what something 'really is' does not make sense. I am sure that but few social scientists would be willing to make Plato's postulate. But the reader will probably have little difficulty in recalling hearing essentially Platonic methodology used in social science classes again and again and yet again. 'What *is* language?' 'What *is* culture?' 'What *is* a specialized animal?' 'What *is* civilization?' 'What *is* an experiment?' 'What *is* Social Science?' To be sure, these questions are sometimes so put for pedagogical reasons, to direct the student's attention to some particular area, or body of phenomena, or as a preface to an explicit definition of the word, very little different from what I am describing here. I feel, however, that the methodological implications of such a form are so thoroughly pernicious, and capable of wasting so much time and introducing so much confusion by the suggestion that there is some particular way in which it is peculiarly appropriate to use a word, that we had better abandon such terminology altogether, setting forth our definitions of the classes which we wish to deal with explicitly, and then turning our attention to the phenomena themselves. *We should not forget that by the time one graduates from a university he has spent sixteen or more years under the influence of pedagogical methods, and if he is used to hearing questions put that way, he will ask them that way in his research, to his subsequent confusion.*

We should come to some decision in this matter. If a man wishes to hold with Plato, then I am far from saying that I can reason cogently enough to convince him otherwise, but it certainly seems to me that the burden of proof lies on those who do wish to make Plato's postulate, and not on those who don't. If we do not wish to make Plato's postulate, we should remember that our class criteria are arbitrary in the sense that we determine them to suit our convenience, and that the class name is merely a convenient tag, meaning nothing in itself, and useless unless we know the class criteria for which it is merely an abbreviation. Such a realization seems simple enough, yet when it is kept in mind and consistently applied, the rate at which seemingly insoluble problems disappear is little short of miraculous, so much so,

in fact that a professor, discussing this point in lecture recently, had to spend some time convincing the class that he wasn't just playing logical tricks upon them.

At the risk of appearing to beat a dead dog, there is one more point I would like to make on the subject of what something really 'is,' and that point is: even if such a question did have a meaning, which I am not prepared to admit, it still need not be a concern of science. Science—physical as well as social—can conduct its investigations and fulfill a useful social purpose if it can discover how things—be they objects, people, or groups of people, *behave,* and if it can give us some small hint about what we can expect of them in the future. Given a thorough knowledge of what a given object, person, or group of persons is likely to do, we can easily do without knowing what sort of a name it has.

V

Let us consider, in the light of this methodology, the question, 'Did the ancient Maya have a civilization?' Now let us rephrase the question in terms of what we have said above, and ask, 'Did the social, political, technological, and intellectual-aesthetic life of the Maya meet the criteria for inclusion in the class 'civilization.' This focusses our attention on what should properly follow: a consideration of what criteria we wish to use to determine membership in that class. Since these criteria must be arbitrary, *we may choose such criteria as suit our convenience,* though if we wish to communicate with others we should remember to make these criteria explicit and to be consistent in their use. Having set our criteria we may then measure the Maya against these criteria and answer 'yes' or 'no' to our original question without further argument. Such a procedure, of course, adds nothing to our knowledge of the Maya—and indeed it would be surprising if it did—it simply makes our knowledge easier to communicate and to think about. If people with whom we wish to communicate understand our criteria for the class 'civilization' we can effect great economy in discourse to them about the Maya in telling them that the Maya were (or were not) civilized. Otherwise—if they do not know our class criteria, that is—we leave them no wiser than before. This procedure seems simple enough. Yet when we try to set forth our criteria someone is sure to object, 'Yes, but is that all civilization is really?' At that point we stand at the methodological crossroad. We can either state flatly, 'The question "What is civilization really?" has no meaning. The word "civilization" designates a class defined by these (explicit) criteria, which we have set up for our intellectual convenience.' Or we can do a scientific about-face and trudge back down the long philosophical road in search of the Platonic 'idea.' The subsequent history of those who have taken that road in the past is not such that it should tempt us to try it.

Yet many people who do not hold with Plato, and many more who have never heard of Plato's metaphysics, would ask the question, 'What is civilization really?' and they do not do so out of mere perversity, but feel that such a question is genuinely meaningful. How can this be, in the light of what I have said above, in which I was apparently offering to lay all our methodological difficulties to Plato's charge? Now, to be sure, I have only set upon Plato because he followed out and set forth as metaphysical principles the implications of the methodology, which had probably existed long

before Plato and will, I fear, persist when Plato's name is known only to specialists in history. For this I think I can see two powerful forces at work.

In the first place there is the subject-predicate structure of the language itself, which permits the construction 'A *is* B'; in fact the structure of the language virtually insists upon such a construction. We are used to that construction, and indeed, it has been useful to us again and again. As children we might, holding some object or other in our hand, or pointing to it, ask some adult, 'What *is* this?' and such an adult, our mother, usually, would reply, for example, 'It *is* an apple,' and we, if we knew anything about the class 'apple,' notably that apples could be eaten, did gain some useful knowledge thereby. If we did not know anything about the class 'apple' we were no wiser than before and usually persisted with such questions as, 'But what *is* an apple?' which frequently elicited some response involving the class criteria, as 'Apples are good to eat.' which was sufficient for our purpose. Now notice that in this process what we found out was something involving behavior—what we could do to the apple, or what it was likely to do to us. And this information was mediated by a name. Hence we came to that point where the acquiring of names for things became a veritable passion with us, a stage that our parents can ordinarily recall. We were acutely uncomfortable in the presence of an unnamed object. We did not know how we could expect that object to behave, or what we could do with it. We were like the Australian aborigine who feels himself obliged to kill any stranger whom he cannot fit into his kinship classifications, since he has no other way to define his relationship with that stranger. So now we feel that all objects must have names and that those names must somehow be meaningful and significant. We feel that there must be some predicate that can be attached to the sentence 'Civilization is ———.' which will tell us more about things. But I fear that in doing so we are merely, as Whorf (6) puts it, 'marching in step with the grammatical structure of the language.' And indeed, if, as I have tried to show, 'civilization' is only a name for a conceptual class, what can we put for a predicate in the sentence above but a synonym, another name for the same class? Such a procedure would add nothing to our knowledge of the phenomena involved. Santayana (4) in his usual rich style, observes:

> . . . The little word *is* has its tragedies; it marries and identifies different things with the greatest innocence; and yet no two of them are ever identical, and if therein lies the charm of wedding them and calling them one, therein too lies the danger. Whenever I use the word *is*, except in sheer tautology, I deeply misuse it; and when I discover my error, the world seems to fall asunder, and the members of my family no longer know one another.

A second reason that such questions as 'Is this (referring to our explicit criteria) *really* civilization?' continue to arise to plague us is that all classification, as I have tried to show, involves abstraction, and rather arbitrary abstraction at that. To return to our example, let us set up some criteria with which to judge the Maya for membership in the class 'civilization.' We can choose some quite arbitrarily, since no one set of explicit criteria now current seems to be more widely accepted than another.

1. Some political control over at least 100,000 people at one time.
2. A recognizable cultural continu-

ity (using the term in Redfield's sense, insofar as his criteria are explicit) persisting for at least 400 years.

3. The undertaking of public works requiring the cooperative, coerced or disinterested labor of at least one twentieth of the population for at least one twentieth of the total working time.

4. A solar calendar with a discrepancy from the solar year not greater than 5 per cent.

5. A means of mechanically recording matters of public or speculative interest.

Now our question reduces to finding out enough about the Maya to apply our criteria. I take it that within the meaning of these criteria the Maya may join the class of civilized nations. But this will not lay the question to rest forever, for someone will surely assert, 'But that is not all that civilization *really is*.' and he will go on to demonstrate this by showing that any particular member of the class so defined contained a great deal more than was enumerated in the class criteria. The point is a simple one. Of course there are more things in the simplest phenomena than can be enumerated in the class criteria. That is the reason that it was necessary to classify in the first place. A whole library could be written without exhausting the descriptive possibilities of a single apple. We do not pretend to know everything that could be known about a particular phenomenon merely because it happens to fit into one of the classes we have set up. Classification always involves abstraction. A consciousness of this point would prevent the troublesome confusion that gives rise to such questions as 'is that all civilization is *really*?' The class criteria do not pretend to tell all that is known of any particular member of the class. What the class criteria do tell is all that we mean to imply when we say that any particular object is a member of such-and-such a class. I take it that some of the confusion that surrounds this point arises out of the fact that people do not always mean only what the class criteria imply when they assign a group like the Maya to the class of civilizations. They feel that the nations in such a class must have more and more basic things in common than merely what are mentioned in any set of criteria. Perhaps the reason for this way of thinking, as well as its virtues and dangers, will be clearer after the next several points have been presented.

VI

One of the commonest errors, it seems to me, in the use of classification is the assumption (usually implicit) that if a class has been defined by several individual characters, and then that class can be shown to have members, then a necessary correlation has been proved between the appearance of those characters. Let me take another chemical analogy. There is a class which on proper analysis can be shown to contain members of the class 'sodium' and members of the class 'chlorine' in a one to one correspondence, and such are the criteria for membership in this class. This class has billions upon billions of members in which the sodium atoms and the chlorine atoms form a whole in which they are about as intimately related as any two things are ever likely to be. But that the class 'sodium chloride' has billions of individual members does not prove that there is a necessary correspondence between the occurrence of sodium atoms and chlorine atoms, and indeed we know that they occur separately. In the case of sodium and chlorine, then, the point is obvious. In the matter of a phonetic script and a wide political integration, or a particular

form of government and a particular economic system, the matter seems to be a good deal more obscure.

This error is much facilitated by, as it were, looking at the processes involved in producing a particular culture backwards. The point I am trying to make is this: given as the *end,* or necessary condition to be fulfilled, the relationship between two culture traits, *i.e.,* their particular relation in a given culture, then the relationship is necessary—which is a completely circular argument. It is a teleological point of view, equivalent to saying that man is the end, hence the purpose and necessary result of organic evolution. If that proposition be admitted, the most extravagant conclusions could be drawn.

Another frequent fallacy is the fallacy of treating the members of a class as if they possessed no other properties than those properties enumerated in the class criteria. Perhaps the reason that this is so is that this method is that of mathematics and geometry, and we know too that the physicists use this method and they get away with it sometimes. In this respect, I often think that nature has been much too good to the physical sciences for the mental health of the social sciences. We often gaze in awe as the physical scientist performs his mathematical manipulations (in which he assumes that the objects in his classes have no other properties than are enumerated in the class criteria, which properties he takes account of in his mathematics) and lo! nature behaves obediently to the physicist's calculations. Now it is clear that in this case we have more than a happy coincidence between our mathematics and the way nature behaves, but it would be a sorry mistake to think that nature had been coerced by the physicist's mathematics. It would also be an anachronism, as students of primitive magic will recognize. Rather we should realize that the physicists have, again and again, altered their mathematics at the behest of nature. This occurred rather spectacularly in the case of the 'ether' fiasco in nineteenth century physics. The physicists had assumed that nature could operate according to no other system of mathematics than the one with which they were acquainted, and had built an elaborate theoretical framework on that assumption. Came the Michelson-Morley experiment, nature kicked over the traces, and it took twenty years and an Einstein to bring order out of the resultant chaos; and when the dust had settled, the physicists were using a very different mathematics. In social science, our data are so vastly more complex, and our classes involve so much more abstraction, that we cannot use the physicist's methods *yet.*

The mention of the degree of abstraction in the classes the social scientist uses brings me to another point. *Presumably as scientists, we are interested in discovering invariant relations between phenomena,* or at least statistically reliable relations. In our work, we must keep in mind that these invariant relations between things are indeed between *things,* not between *classes.* I cannot urge this point too strongly. The more abstraction we have to do in order to classify, the more characters we have to overlook in order to extend class membership, the less is the likelihood that we will find invariant relations between our classes and the less is the likelihood that the members of one of our classes will behave similarly in a given situation. In other words, there is more possibility that the dissimilarities that we overlooked in classifying will disrupt the uniformity of behavior of our class members when we have overlooked many dissimilarities

to get large class membership. For example, the relationship (from the point of view of what happens when they get together) between the members of the class 'metallic sodium' and the members of the class 'water' is invariant. The relation between the same class 'sodium' and the class 'mass spectroscope' is not invariant, since the result of members of the class 'sodium' getting together in a certain way with a member of the class 'mass spectroscope' depends, among other things, on the nuclear mass of the atoms involved. Since we ignored the difference in nuclear mass when we classified all the atoms which showed the same chemical behavior together to get the class 'sodium,' we now have to split that class into several subclasses to get invariant relations with the class 'mass spectroscope.' I think it is worth while to point out that this is the very opposite of the Platonic system in which the larger and more abstract the class, the more invariant were its relations with other classes, because the more abstract the class, the less were the so-called 'accidentals' involved and the more did the 'essence' of the class operate unhampered.

I have been asserting throughout this paper that class criteria were arbitrary. It does not follow, however, that all classes we set up will be equally useful to us, or that the classes that we find useful may not, as we think the classes of the physicists do, somehow reflect the order of nature. I have only a few very general remarks to make on what kinds of classes it seems likely that it might be useful for us to set up. That systems of classes whose criteria distinguish into several classes those things whose behavior is significantly different for our purposes will be useful to us is, I think, self-evident. That is, it is imperative that we have class criteria which will distinguish members of the class 'toadstool' from members of the class 'mushroom.' I think that the converse of this proposition may well be true in the social sciences. That is, if we have classes whose criteria separate into several classes people whose behavior is not significantly different, I think the effect of those classifications may well be pernicious. I have particular reference here to the classes set up in physical anthropology. While there is no methodological difficulty in setting up the classes of the physical anthropologist, yet I cannot but sense an incongruity in the fact that I am registered in a social science course that looks toward the establishment of a 'United, Free, Peaceful, and Prosperous World' and at the same time studying physical anthropology which, according to Howells (1) is concerned with finding more refined means of telling people apart. I am not suggesting that 'racism' is the fault of the physical anthropologists, yet I cannot but wonder if such exhibits as the Hall of Man in the Chicago Natural History Museum do not serve to confirm the ignorant in their prejudices.

About the use in social science of classes which have no members—the so-called 'ideal types'—I doubt that it is possible to come to any general conclusion. It is true that the economists have made good use of such a type in 'the economic man,' yet we are told that significant problems in economics have been overlooked simply because they were not adapted to that sort of analysis, while other problems which did lend themselves to that sort of handling have been analyzed far beyond the point that their importance would justify. I suppose that the justifiability of the use of such classes depends somewhat on whether one believes the user to be capable of remembering that the class has no members.

VII

Let us now apply the above considerations to an assignment such as is not infrequently given in a university course in anthropology. Here is an example taken from an actual course:

> It has been noted that the Andean and Middle American civilizations *together* had practically all of the elements of culture characterizing the ancient Old-World civilizations (metallurgy, writing, cities, mathematics and science, calendar, large political organization, etc., etc.); but that the selection was such that the two areas *individually* had partial, and complementary, developments. In no more than 500 words:
>
> 1. Indicate the elements of civilization that were common to Andean and Maya-Aztec, and those that were confined to one or the other.
>
> 2. Give your own evaluation of which of the two areas had the higher degree of civilizational development.
>
> 3. How might one explain the development of the two civilizations (Andean and Maya-Aztec) each without some elements that—if we knew only the Old World—we might think of (in the light of Jacobsen's S.R. II, No. 23) as necessary to civilization?

POINT ONE: Notice the 'etc.' in the first part of the assignment. It indicates some uncertainty as to what elements characterize a civilization. Let us deal with the points mentioned. In the matter of metallurgy, it was present in both areas, but important in the technology or weapons of neither. In writing, the Maya had the more familiar system; certainly the Andean organization had a highly useful notation. In mathematics, the Maya had some features, notably the zero, which the Inca lacked, but the Inca made good use of what they had. In the matter of cities, the Maya lag behind as they used their 'cities' only as meeting places, while the Inca had cities in which people lived. In calendric science, the Maya were clearly more accurate. In political organization, the Inca empire at least was both larger and better integrated than that of the Maya or Aztec. Such exhausts the characters suggested. We could continue indefinitely. In weaving, the Inca perhaps have the advantage. I believe we can think of the subsistence economy of the Inca as more closely tied in with the political structure than in the Maya area, a point which would interest Childe. In agricultural techniques, the Inca were acquainted with methods which the Maya were not, but perhaps the Maya didn't need such techniques. In domestication of animals, the Inca clearly outdistanced the Maya. And so forth.

POINT TWO: 'An evaluation of which of the two areas had the greater degree of civilizational development.' In the light of the methodology given above, I think we had better dismiss this question as meaningless. The individual points were (purposefully) compared in Point One. If the word 'civilization' designates a class, and that class is defined by certain criteria, then I wonder how I can do anything useful with the idea of 'degree of class membership.' In other words, in this system, the assertion that says, 'the Inca were civilized' would be only a short-hand way of saying that the Inca possessed a certain number of specified traits. Let us say one of these traits is 'domesticated animals.' Now, if I say, using the same criteria, that the Maya were 70 per cent civilized, I wonder if I convey any sort of useful information to my hearer. Would such a statement convey any specific information about, say, the matter of domesticated animals? It is hard to see how it could.

The recipient of the information has no way of knowing whether the domesticated animals were part of the 70 per cent in which the Maya were asserted to be civilized, or part of the 30 per cent in which they were uncivilized. Within the purpose at hand, the concept 'civilization' is a useless encumbrance, and I would save time by stating what traits it was that the Maya did or did not have. In this context, at least, the concept of degree of class membership is doing no intellectual work.

POINT THREE: This is the most interesting. What seems to have happened is this: using some unspecified class criteria, the American instances got lumped in with the Old World instances in a common class 'civilization.' Then attention was given to one of the members of the class, Mesopotamia, and it was asserted on the basis of the historical development in that one example, that there was a necessary correlation between the several traits observed and a rationale advanced to prove it. The only meaning that can be attached to the phrase 'necessary to civilization' is that the correlation between the characters used to define the class is necessary and inevitable. This, I think, is an excellent example of the 'looking backward' fallacy that I spoke of above, which emerges, of course, when these several characters appear separately in the New World, as for example in the Maya area, writing without a subsistence technology dependent on a large political organization. However, this instance does not invalidate the arguments for the related roles of technology and writing in the Old World example. In other words, that many people pass through the same door of Marshall Field's department store in a day does not necessarily prove that they all came to town on the same streetcar, but this last does not disprove that some one particular means of transportation was not historically active in transporting some one particular customer. Or that the Maya developed a writing that they did not put to any particularly practical use does not necessarily invalidate Childe's reasoning about why writing developed in Mesopotamia. So we really have nothing to explain, it simply appears that the assertion of the necessary correlation between writing and a technology based on public control of water supply was somewhat premature.

If we say that some cultures, such as the Andean, belong to the class 'civilizations,' and we say that writing is one of the class criteria for inclusion in the class 'civilization,' and then deny that the Andean culture had writing, we do indeed have something to explain. However, I do not think we need send an expedition to South America to uncover the source of our confusion.

I have not given much attention herein to the development of a set of class criteria for such a class as 'civilization.' The reason I have not done so is that the members that people usually mean to include when they use that class name are so few and the differences between those members so numerous, that I wonder if we do effect a great economy in discourse by having such a term. We might, I think, just as well content ourselves with simple enumeration when we mean to include Chinese, the Mesopotamians, the Egyptians, the Cretans, the Greeks, the Arabs, the Hindus, the Western Europeans, the Maya-Aztecs, the Andean peoples, and perhaps, the West African cultures. Or we have another recourse, we can define the class as simply containing those members, a means of classification I have not spoken of before, the so-called 'definition by extension.' Such a class may serve our purpose in discourse, but we

must be under no misapprehension about it. *Absolutely no conclusions may be drawn from class membership in a class defined by extension, i.e.*, by simple enumeration of its members.

In regard to finding some sort of meaning to attach to the word 'civilization' it often amazes me to see the stubborn tenacity or tender solicitude with which people will worry over some poor worn-out word. They will define it and redefine it, use it in this connotation and in that connotation, now in this context and now in another, until such a confusion surrounds that unhappy word that no one can be sure what someone else means to imply when he uses it; yet they will not give it up, for they are used to it, and to hearing it used, and they feel that so many people use it that it must mean something, though as to what, they are admittedly not clear. It is worthwhile to quote Charles S. Pierce (3) on this point:

> The very first lesson that we have a right to demand that logic shall teach us is, how to make our ideas clear; and a most important one it is, depreciated only by minds who stand in need of it. To know what we think, to be masters of our own meaning, will make a solid foundation for great and weighty thought. It is most easily learned by those whose ideas are meager and restricted; and far happier they than such as wallow helplessly in a rich mud of conceptions. A nation, it is true, may, in the course of generations, overcome the disadvantage of an excessive wealth of language and its natural concomitant, a vast unfathomable deep of ideas. We may see it in history, slowly perfecting its literary forms, sloughing at length its metaphysics, and, by virtue of that untirable patience which is often a compensation attaining great excellence in every branch of mental acquirement. The page of history is not yet unrolled which is to tell us whether such a people will or will not in the long run prevail over one whose ideas (like the words of their language) are few, but which possesses a wonderful mastery over those which it has. For an individual, however, there can be no doubt that a few clear ideas are worth more than many confused ones. A young man will hardly be persuaded to sacrifice the greater part of his thoughts to save the rest; and the muddled head is the least apt to see the necessity of such a sacrifice. Him we can usually only commiserate, as a person with a congenital defect. Time will help him, but intellectual maturity with regard to clearness comes rather late, an unfortunate arrangement of nature inasmuch as clearness is of less use to a man settled in life, whose errors have in great measure had their effect, than it would be to one whose path lies before him. It is terrible to see how a single unclear idea, a single formula without meaning lurking in a young man's head, will sometimes act like an obstruction of inert matter in an artery, hindering the nutrition of the brain, and condemning its victim to pine away in the midst of intellectual plenty. Many a man has cherished for years as his hobby some vague shadow of an idea, too meaningless to be positively false;[4] he has, nevertheless, passionately loved it, has made it his companion by day and by night, and has given to it his strength and his life, leaving all other occupations for its sake, and in short has lived with it and for it, until it has become, as it were, flesh of his flesh and bone of his bone;

[4] For example, 'Culture as an integrated whole'?

and then he has waked up some bright morning to find it gone, clean vanished away like the beautiful Melusina of the fable, and the essence of his life gone with it. I have myself known such a man; and who can tell how many histories of circle-squarers, metaphysicians, astrologers and what-not, may not be told in the old German story?

VIII

There is one more point to make, and then we can bring this discussion to a close. The point is an important one. The alert reader will have noticed by now that these criteria by which I propose to decide class membership are in themselves classes, as I have been using the term, and he may wonder if I have not thereby involved myself in a circular argument. We can extricate ourselves from that difficulty by paying attention to the direction, with respect to degree of abstractness, in which we go in using classes to define other classes. We must take into account the 'order of abstraction,' to use Korzybski's (2) terminology. If all our information, as I have been trying to show, comes from phenomena, then it is clear that the classes we use to define other classes must be closer to the phenomena than the class being defined; *i.e.*, our class criteria must belong to a lower 'order of abstraction.' To take an example, we cannot usefully define the class 'apple' by saying that it is a subclass of the class 'fruit,' since the class criteria for membership in the class fruit come in part from the properties of the members of the class 'apple.' To know about the class 'fruit' we must first know about apples, pears, peaches, and so forth. Now it is clear that words will not indefinitely serve our purpose here, for as we descend the orders of abstraction we will eventually reach those unnamed classes, the perceptions for which there are no words; and to explain to someone else what we mean by some common noun, we are reduced to pointing at the object in question, in an effort to cause the other person to experience roughly the same perceptions which we experience. The older metaphysicians seemed to think that this procedure was somehow undignified, and the logical contortions they went through trying to define words always with more words remain to confuse the students of philosophy today. Yet if it were not true that we had to go to phenomena for our knowledge ultimately, then the only research tool a scientist would need would be a dictionary and he would be the most learned man whose dictionary was the most complete. I do not think we need to labor this point.

I would not have it thought that, when I say that I would dismiss the question 'What is civilization *really?*' as meaningless, I am implying that the phenomena usually so designated are not important or that they may not be studied. All I am trying to do is to extricate the discussion from the mischievous effects of a terminology which is not in accord, I am sure, with the methodological assumptions that we would make if we made our assumptions explicit. The several phenomena can then be studied more easily and hypotheses made and tested as to what is common and what is unique in each. Such common elements may be discerned and when discovered may prove to be of the gravest import to our own society. But the postulate that there is a common element which is basic to each begs the question, and may prove a hindrance to our work. Suppose we discover a process at work in all the examples, except, let us say, the Chinese. Shall we then ignore that process since, being lack-

ing in the Chinese instance, it cannot be of the 'essence' of civilization? Such a procedure would be letting a means of simplifying discourse assume altogether disproportionate magnitude.

But is this indeed the only reason we have sought these classifications? Did we wish only to find a term to make our discourse more compact and concise? Did we expect only to unravel painstakingly, step by step, the several causal sequences that must have operated to produce the remains that the Maya and the Inca have left us, and to gain such insight as we could into the processes by which man has reached his present state? Or do we still half believe, that if we study these matters long enough there will eventually emerge, in the midst of the potsherds and the king-lists, the stelae and the ruined temples, the vague outlines of the 'essence' of civilization, the faint glimmerings of the Platonic 'idea'? If so we are doomed to disappointment. Let us clear our minds of metaphysics. As scientists we can do useful work, but a search for the Platonic 'idea' of civilization is inappropriate to the temper, the purpose, and the methodology of the social sciences.

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THE REVISION OF VISION:

*A Note on the Semantics of Modern Art**

S. I. HAYAKAWA

HAVING ANNOUNCED my topic as the semantics of modern art, my first obligation obviously is to tell you what I mean by semantics, since that word is, although getting increasingly familiar, only vaguely understood except by people who have gone out of their way to acquaint themselves with semantic literature. By semantics, we mean the interpretive habits that people have within them by means of which they apprehend and react to the signs and symbols, sign-systems and symbol-systems, of the world around them. We might call those interpretive systems 'thinking habits,' except that by calling them *semantics* (which is derived from the Greek 'root' *sema,* meaning *sign,* as in the word *semaphore*), we are able to call attention more sharply to the fact that most of what we call thinking is a process of evaluating, reacting to, and manipulating various systems of symbols and signs—including that entire system of vocal signs that we call language.

Another reason for not calling our interpretive habits 'thinking habits' is that if we do, we are under ordinary conventions forced to say such things as, 'John's thinking habits are good, William's thinking habits are terrible,'—a kind of statement that doesn't give much insight into where William went wrong, and may only indicate that we agree with John and disagree with William. Nor does it help to say that John is logical, William is illogical—because, as we are all able to observe in everyday life and as we have been told by modern psychiatry, people with the grossest misevaluations, including many that we must regard as mentally ill, are often amazingly logical —and usually it is just because they are so logical that no one can help them. Psychiatrists speak of such people as having 'highly systematized delusions.' Logic is after all like a sausage machine: if you put in horse meat, you get horse-meat sausages. If your basic assumptions are absurd, then the more rigorous and excellent your logic, the more certainly will

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your conclusions be equally absurd. And logic as such has no way of determining the truth or absurdity of one's initial assumptions. So we come back, then, to semantics as the interpretive habits that determine how people react to the signs and symbols of their environment.

Now in order to state clearly what I want to say about modern art, I shall have to describe two kinds of semantics, two kinds of sets of interpretive habits that people ordinarily have. The first I shall call, using Korzybski's term, the semantics of *identification,* using the word identification in the special sense of identifying the symbol for a thing for the thing itself.[1] One can give many examples of this, but let's take a few simple ones. Some people, as you all know, react to fictional representations in movies and soap-operas as if they were realities. They write to Lewis Stone asking for legal advice, they write letters of sympathy or guidance when characters in a soap-opera are confronted by domestic catastrophies (as they almost always are), and I am told that when Edward G. Robinson, after playing a series of gangster roles, visited Chicago, some of our local gangsters called on him, in admirably fraternal fashion, to pay their professional respects. All such cases we call *identification reactions,* since symbols (in this case dramatic symbols) are identified with the realities they are supposed to stand for.

There are many other kinds of identification reactions, such as reacting to words as if they were things, so that a verbal description of, for example, a gruesome surgical operation, appears to be as unendurable to some people as the operation itself; or, to take an example from the pictorial arts, salivating at the sight of a four-color process picture of a baked ham in an advertisement in the *Ladies' Home Journal.*

As contrasted with the semantics of identification is the semantics of *non-identification,* which would mean simply NOT reacting to words as things, NOT reacting to a symbol as if it were the reality it stood for, NOT writing letters to Charlie McCarthy, NOT salivating at a picture of a baked ham.[2]

Another set of contrasting semantic habits that I need to explain is the difference between *static, rigid evaluative habits,* as opposed to *flexible and dynamic evaluative habits.* By static and rigid evaluative habits I mean the tendency of some people to think about the world in terms of symbols, linguistic or otherwise, that are permanently and inflexibly defined.[3] To them the world is made up of clearly and absolutely defined classes of objects or entities. That is to say, however one defines the words with which we sort out the data of experience and find our way around, the person with static and rigid evaluative habits is content with his own definitions—to him, women are women, politicians are politicians, love is love, hate is hate, government is government and business is business, east is east and west is west, right is right and wrong is wrong. Such persons often regard themselves with considerable complacency as realists. You will understand, of course, that I am not talking about the specific opinions they may hold, but rather about the attitude they hold towards their own opinions. They are permanently unaware of the extremely uncertain relations that necessarily hold between their descriptions of

[1] A. Korzybski, *Science and Sanity* (1933), 194-197, 201, 399-400, 405, 408, *et passim.*

[2] *Ibid.,* Chapter XXVI, 'On "Consciousness" and Consciousness of Abstracting.'

[3] *Ibid.,* Chapter V, 'General Linguistic,' Chapter VII, 'Linguistic Revision'; see also index under 'Allness.'

reality and reality, between their words and the things and events the words stand for. They are usually so convinced that they know the score that you can't tell them that the game is over and a new and different one has begun.

On the other hand the person with flexible or dynamic semantic habits enjoys no such blissful certainty about what he knows. The one thing he is sure of is that he doesn't know too much about anything. His symbols are defined, to be sure, but not inflexibly, since he tends to think of the world not as a collection of static objects and entities, but as a dynamic *process*. He is in a profound sense time-minded and relation-minded. By time-minded, I mean that he knows that whatever he knew yesterday or the day before about anything may no longer be *quite* true today. Consequently he is thoroughly undogmatic. By relation-minded, I mean that he is constantly prepared for the vast changes in the meanings of things that result from the changes in the relationships in which they are found. He does not, like the philosopher of old, seek to know the 'essences' of things—which to him is a pretty meaningless quest. He seeks rather to understand and know relationship.[4]

A small but significant example of the difference between the static object-mindedness and the dynamic relation-mindedness is offered by the contrast between the old type of archeological display at the Chicago Natural History Museum and the new type. In the old, the curators were content to display objects, such as arrowheads in rows, with appropriate labels. In the newer displays, however, arrowheads become part of ingenious dioramas in which these objects are seen in their *relationships* to the hunting, food gathering, and other activities of the people who used them—the modern curator going on the very sound principle that objects as such are meaningless, and that relationships give to objects whatever meaning they may have.

As I go into the subject of art, then, I should like you to keep in mind these contrasting semantic or interpretive habit-patterns: first, the semantics of identification, involving confusion of symbol with things symbolized, involving a static object-mindedness (summarized in the conviction that pigs is pigs) and rigidity of attitudes; secondly, the semantics of non-identification, involving a dynamic time-mindedness and relation-mindedness, and flexibility of evaluations, which perhaps can be summarized in the statement, 'pigs were pigs the last I knew, and they may still be depending on what we choose to call pigs and in what relationships we are considering them.'

II

With this brief statement of the two great sets of contrasting semantic patterns to be found in Western civilization, we may proceed to our discussion of modern art. It will be the thesis of this address that the semantics of identification has been, since Greek times, consciously or unconsciously the public ideal of western art. This ideal is explicitly presented in the story of Pygmalion, who, according to legend, confused a marble symbol of a woman—a symbol that he had created himself incidentally — with an actual woman, and fell in love with it, thus proving himself a semantic nitwit of the worst kind. Aphrodite, instead of punishing him for his stupidity, rewarded him, changing the statue into a woman with whom presumably he was able to live happily ever after. Thus did the Greeks find divine sanction for a theory of art

[4] *Ibid.*, especially Chapter XXIX, 'On Non-Aristotelian Training.'

which stated that that art is greatest that is the most likely to cause the beholder to have an identification reaction of confusing the symbol with the thing symbolized. *Seeing, according to this theory of art, should result in believing.*

There are many other stories to show how deeply rooted this theory of art is in western culture. There is the story of the art-contest in a public market place. The crowd was on the point of awarding the prize to a painter who had done grapes so realistically that birds gathered to peck at his painting, when they noticed a painting with curtains drawn over it. They asked the artist to remove the curtains, but he refused. They asked him repeatedly and he continued to refuse until they became very angry. When they grew angry enough to tear the curtains off themselves, they discovered that there were no curtains—it was simply a painting of curtains. Deeply impressed with the skill of the artist, they awarded him the prize. Then there is the story of the Dutch painter whose greatest source of professional pride was the fact that when he painted a fly on the face of a portrait, people kept trying to shoo it off. There is again the story of the living statue in Shakespeare's *The Winter's Tale.*

Basic to such views of art is Aristotle's definition of art as imitation, a typical application of which is to be found in Sidney Colvin's definition of sculpture as 'a shaping art, of which the business is to express and arouse emotions by the imitation of natural objects, and principally the human body, in solid form, reproducing . . . their true proportions in three dimensions.'[5] While it is true that interpreters of the aristotelian doctrine of imitation have usually insisted, in one one way or another, that imitation of nature does not mean simply copying nature, it is also true that for centuries and (so far as the general public is concerned) into our own time, an estimation of the artist's accuracy or inaccuracy in copying nature has always been an important, and often the chief, ingredient of art criticism. It isn't so very long, after all, since it was said that El Greco was a great artist *in spite of* his distortions of nature. [EL GRECO: *St. Martin and the Beggar.*] To save El Greco's reputation, the legend was concocted that he was astigmatic—as if to say, since he copied nature as well as he could, poor fellow, we must give him credit for trying. Nor is it so long ago since anatomy was a fundamental subject in every art school. And furthermore, there is the belief held over many centuries in the western world that the traditional western art of imitation is a high point in artistic development, the primitive arts of Africa, the pre-Hellenic cultures, the American Indians, the arts of Asia, etc., being imperfect attempts at imitation on the part of people who would have been glad to copy nature more exactly if they only knew how. And today, so far as the vast majority of the public is concerned, as you can tell by looking at the selection of paintings and reproductions in any department store, those pictures are most loved that are the most likely to cause identification reactions.

Now, I believe we can begin to understand cubism, abstractionism, surrealism, dadaism, fauvism, the interest in the primitive arts of Africa, Oceania, and the American Indians—the whole range of artistic events that since the 1880's have been making artistic conservatives angry and miserable, if not downright ill, if we regard it as having, among other aims, two semantic purposes: (1) The entire modern movement in art is a revolt

[5] See *Encyc. Brit.*, 11th Edition, 'Fine Arts.'

against the semantics of identification, and an attempt to establish the semantics of non-identification. (2) The modern movement in art attempts to establish a dynamic semantics of time-and-relation-mindedness, and to abolish the static and rigid semantics of object-mindedness.

What is meant by the rejection of identification reactions is something like this. The modern artist does *not* want you to stand in front of a painting and say, 'Aren't they having a lovely time!' [JAN STEEN: *Family Concert*], or 'Doesn't that make your mouth water!' [PIETER CLAESZ: *Still Life* (table laden with food)], or 'I'd like to get my hands on that woman!' [TITIAN: *Venus of Urbino;* BOUGUEREAU: *Cupid and Psyche*]. He wants you first and foremost to remember that what you have before you is *not* a Dutch interior, a table of food, or a woman, but *a painting of* a Dutch interior, a table of food, or a woman. He uses many devices to prevent identification reactions—devices to remind you that it is a picture and not the reality. Sometimes he uses deliberate distortion of the figures [MODIGLIANI: *Reclining Nude*]; sometimes he ignores conventional perspective, deliberately avoiding the illusion of depth to remain true to the two-dimensional surface [PICASSO: *Red Tablecloth;* STUART DAVIS: *New York under Gaslight*]; sometimes he leaves bare patches on the canvas; often he leaves his brush strokes plainly visible [ROUAULT: *Clowns;* VAN GOGH: *Sunflowers*]; sometimes he uses extreme stylization [PICASSO: *Demoiselles d'Avignon*]; sometimes he draws things that have no objective existence on land, in the sea, or in the air, or like Chagall he may paint two suns in the sky or a self-portrait showing seven fingers on one of his hands. Whatever the modern artist does, he never lets you forget for a moment that what you are looking at is a painting. [CHAGALL: *The Drunkard*; PAUL KLEE: *Fleeing Spirit, The Dancer.*]

Surrealism, too, is another kind of rejection of identification reactions. In Dali and Tchelichew and Max Ernst, you find in exaggerated abundance and in great perfection the techniques that the old masters employed to produce illusions of depth, illusions of the bloom on grapes, illusions of human flesh, illusions of vegetation, etc. But they use this amazingly skillful technique to make a mockery of your identification reactions. The fairest flesh ends in putrescence; ants crawl over things; vaguely anatomical objects jump up and down in nightmarishly wide spaces; according to surrealists the real reality is intolerable. Surrealism and dadaism are on the whole profoundly negative movements. They are savage in their assault upon our identifications. It is as if they were saying, 'if you like to believe what you see, go ahead, but we are determined to make you thoroughly sick of doing so.' [SALVADOR DALI: *Inventions of Monsters*; MAX ERNST: *Napoleon in the Wilderness*; PAVEL TCHELICHEW: *Hide and Seek.*]

Indeed, one can put the case even more strongly, and say that the modern artist rejects outright the aristotelian doctrine of art as imitation. From the modern artist's point of view, the aristotelian doctrine that the business of art is 'to express and arouse emotion by the imitation of natural objects,' overlooks a fundamental fact of artistic experience, namely, the difference not in degree but in *kind* between the emotion aroused, let us say, by a tree, and the emotion aroused by a *picture of* a tree. Art is not, to modern artists, imitation in any sense. This fact was brought home to me in a small but vivid way when I was arguing about the doctrine of imitation with a friend of

mine, a disciple of Aristotle now teaching at the University of Chicago. I showed him an abstract hand-sculpture I had made as a student at the Institute of Design under Moholy-Nagy—it looks like nothing on earth, of course, like most things made by students of Moholy-Nagy. 'This,' I said to him, 'is a refutation of your doctrine of imitation. This isn't an imitation of anything.' 'On the contrary,' he said, 'it imitates an idea in your mind.' Those of you who know something of the methods of modern art instruction know the answer to that. I said, 'Not at all. The whole point of this exercise is that you *don't* know when you start how you're going to end up. You *discover* the possibilities of the specific block of wood in front of you as you go along, being guided from moment to moment by the feel of it in your hand as you chisel off a bit here or saw off a piece there. The outcome is as much of a surprise to you as it is to anyone else on earth. This is not, therefore, an imitation even of an idea in the mind.' 'Then,' my friend said, it's an imitation of an idea in your subconscious.' To that I had no answer. When people start backing up Aristotle with an appeal to Freud, I give up. It isn't cricket.

But why, it may be asked, does modern art distort quite as much as it does? And why, as in abstract painting, does it throw out representation altogether? The answer, I believe, is largely to be found in the cultural context of western art. In spite of new techniques, distortions, new conventions in art, etc., that bring sharply to attention the properties of the painting as distinct from the properties of the object painted, the habit of expecting some kind of imitation is too deeply rooted in the general public to be easily displaced. As long as any recognizable similarity exists between a painting and the object painted, people are able to say, as they become accustomed to the newer conventions, 'That's a pool hall,' or 'That's a tiger in the jungle.' So saying, they go on appreciating pool-halls or tigers in the jungle, to the almost complete neglect (at least at the conscious level) of the visual relationships which are necessarily the main point of art. Therefore, more heroic measures are necessary in order to destroy these reactions. In producing painting with extreme degrees of distortion, or with no content whatsoever, the artist is saying, 'Now, damn you, will you stop saying "That's a tree," "that's a woman," etc., and really look at the painting *as a painting*, as a visual experience, for a change?' [PIET MONDRIAN: *Composition in White, Black and Red; Composition in Blue and Yellow; Composition in White, Blue, Yellow; Victory Boogie Woogie.*]

The abstract artist, then, is engaged in a most difficult kind of educational endeavor. By removing imitative content, he is trying to make you stop saying and asking all the things that keep you from experiencing the very thing that justifies the existence of any painting, modern or ancient, namely, the exciting or strange or deeply relaxing set of visual relationships that are in front of you. Wendell Johnson makes the following observation. 'Most people, according to experienced swimming teachers, find it very difficult to learn how to float—apparently because there is nothing to learn. You don't do anything in order to float. What you have to learn is to do nothing that would keep you from floating.'[6] A very similar situation exists regarding abstract art. Because of the doctrine of imitation, people keep asking, 'But what *is* it? What does it represent? Does it just represent the

[6] Wendell Johnson, *People in Quandaries* (1946), pp. 47-48.

artist's mood? What does it mean? And does the artist himself know?' The more they thresh about asking such questions, the deeper they sink. It is not lack of sophistication, but over-sophisticated familiarity with the skillful techniques of inviting mass-identification reactions such as are found in the degenerate art of Norman Rockwell, that prevents the majority of us from understanding abstract art. What we have to learn is to say nothing that keeps us from seeing. The abstract artist approaches this problem by trying to remove all temptation to say anything. Needless to say, he has not always been successful in this endeavor.

III

Next we may consider the time-and-relation-mindedness of modern art. To say that the art of the past has been static would be, of course, untrue, because all great artists have devised their own ways of suggesting motion and activity. Nevertheless, the prevailing assumption about painting and sculpture has traditionally been that they are 'space arts' as opposed to poetry and music, which are 'time arts.' Therefore, painting and sculpture have in one way or another been deeply influenced by the notion that they must necessarily exclude the time-dimension in their representation of objects. As Wordsworth said, it is the purpose of painting

'to give
To one blest moment snatched from fleeting time
The appropriate calm of blest eternity.'

In further support of this contention that the basic assumptions of western art have been static, I need only to point to the plaster casts and other objects that used to be standard equipment in every art school, and to the long-standing tradition of using live models, whose job is to *stay still* while they are being drawn. When it comes to the assumptions of the general public, static object-mindedness is even more clearly revealed. In my teens I worked in the amateur photo-finishing plant in a chain of drug stores. More than nine out of ten of the snapshots that we had to finish and return were composed in an identical way, namely, the subject standing plumb in the middle, as static as a sack of rutabagas, without ever any gesture or variation of pose or distribution of background to suggest motion. Finally, there is the matter of conventional perspective, which means looking at the world from a fixed point in space. Traditional perspective, as Gyorgy Kepes says, 'froze the living, fluctuating wealth of the visual field into a static, geometric system, eliminating the time element always present in the experience of space, and thus destroying the dynamic relationships in the experience of the spectator.'[7]

Like identification reactions, object-mindedness is deeply rooted in our culture, and again heroic measures are necessary in order to displace them. Modern art has made the introduction of the time-dimension into painting an explicit aim.

To start with a simple example, today we do not find much difficulty in understanding and liking Balla's little classic. [GIACOMO BALLA: *Dog on a Leash, 1912.*] Yet it would be objected by many serious-minded people that a dog doesn't have several tails—and that therefore, although this picture may be an amusing trick, it still isn't art. Consider the assumption underlying such a remark. It assumes that the static dog, whose tail keeps still so that it can be counted, is the real dog. But as a matter of life-experience, the more fully alive a dog is, the harder it is to tell whether it has only

[7] Gyorgy Kepes, *Language of Vision* (1944), p. 86.

one tail or several. Which then, is the realer dog—the dog with one tail, or Balla's?

Similarly in the case of the famous painting by Marcel Duchamp. [DUCHAMP: *Nude Descending the Stairs.*] Some of you will remember that when this painting was first shown in New York, it almost created a riot, and when it was shown in Chicago, a newspaper man called it 'Explosion in a Shingle Factory,' so that thousands of curiosity seekers came to view it and laugh and jeer. What both Balla and Duchamp were doing was simply showing simultaneously successive moments of time. Duchamp was not content to have the nude poised and frozen in one position on the stairs. What delighted him was how she moved.

There is, of course, a simple reason why this time-dimension should become important to the twentieth century painter. Vision is a means of orienting ourselves in space. In an age of trains, automobiles, and airplanes, in an age in which the mere task of getting across the street alive requires to an unprecedented degree the ability to interpret space-time relationships of moving objects, the old vision becomes totally inadequate. We are compelled by technological necessity to think in space-time relationships of a new kind. The artist, if he is to train our vision and truly convey the modern feel of a visual experience, must necessarily find some means of dealing with time as a factor in his compositions.

There are other techniques for the introduction of the time-dimension in modern art. Certain artists have evolved methods of using simultaneously two or more points of view in the same painting. While this trick is not without precedent in earlier European painting, it is carried to new lengths by the moderns. Many of the still lifes of the early '20s by Picasso and Juan Gris and Braque baffle people only because they feel that one must necessarily look at things from one point at any one time. But we live in an age in which we are necessarily aware of many aspects of anything at one and the same time. [JUAN GRIS: *Still Life.*]

In the new art form known as the mobile we see again the explicit introduction of time into artistic composition. Looking at a mobile is like watching the waves in the sea or the flames in a fireplace—it is a visual experience that is deeply satisfying since there is both unexpectedness and order — variety and unity. And a good mobile, like some of those by Alexander Calder and by Moholy-Nagy, doesn't ever become boring. One learns from them too how to see and take delight in changing relationships. [CALDER: *Lobster Trap and Fish-tail;* MOHOLY-NAGY: *Mobile.*]

When our little boy was about 17 weeks old, I suddenly got an idea and I made a mobile with colored cardboard and thread and hung it over his crib, where it revolved for minutes if you wound it up by twisting the string. To my great delight it not only attracted his attention, but he would watch it revolve for ten and twenty minutes at a time, kicking and waving his arms and gurgling with pleasure. He was undergoing what I imagine must be one of the most tremendous of an infant's adventures—he was learning to see.

In many ways, what my mobile helped to do for our little infant is what modern art is trying to do for us—except that none of us is any longer as clear-eyed as we were at the age of 17 weeks. As we grow older, our culture teaches us to translate the dynamic of events into static, fixed, and knowable 'objects.' It has been, through the long centuries since Greek

times, our means of finding security in an uncertain world—and most of the art of the occidental past has been an instrument to that end.

IV

And, as I have said earlier, the semantics of fixed, known 'objects,' summarized in the conviction that pigs is pigs, was translated at higher levels of abstraction into fixed ideas on the basis of which we made our adjustments to life: men are men, women are women; government is government, business is business; Europe is Europe and America is America. And for centuries the chief preoccupation of the philosophers of our culture was to fix categories and to get things sorted, so that one would always clearly know what was pigs and what was not pigs, what was government and what was not government, etc.

Suddenly, however, the entire system of static evaluations, under the impact of the rapid development of science and technology in the past hundred years, has been rendered obsolete. With increasing rapidity in our own times, we have seen the old categories crumble, so that objects and entities as such no longer mean very much; today all fields of knowledge are concerned with relations. As Eddington has said in *Space, Time and Gravitation* with respect to the physical sciences, 'The relativity theory of physics reduces everything to relations; that is to say, it is structure, not material, that counts. The structure cannot be built up without material; but the nature of the material is of no importance.' We have been taught by modern science that the so-called objective world itself is a relationship between the observer and the observed, so that ultimately we are able to know nothing but that relationship. In what were formerly the separate fields of geography, geology, botany, zoology, and climatology, we have seen in our own time the rise of a new science, ecology, which is the study of the relationships of climate to land, land to vegetation, vegetation to animal life, and all of these to each other. In the study of industrial problems, as in the researches of the Western Electric Company in Chicago, we have learned that there can be no fixed definition of a factory worker as a unit of productive capacity and that the entire network of relationships of workers to supervisors and of workers to each other are the chief determinants of production.

In the realm of economics and politics, we have known for a long time (although we are still unable to act on that knowledge) that it is not separate sovereign political entities that matter, but the network of international political and economic relationships that matter. A famine or a collapse of prices in one nation can overthrow a government in another nation on the other side of the world. And peace, as we have finally learned, is indivisible. We can no longer say, as isolationists have long been accustomed to saying, 'Europe is Europe, America is America.[8]

Modern art, then, like all of modern thought, is an attempt to overthrow the age-old habits of thought (or semantic patterns), the semantics of identification and the semantics of static and rigid object-mindedness, in favor of the dynamic semantics of non-identification and time-and-relation-mindedness. Vision and language are the two most important means we have of apprehending reality. How we talk and how we see determine, more than anything else, how successful we are in mastering our environment.

[8] See comments on biology, psychology, politics, economics, art history, etc., in A. Dorner's *The Way Beyond 'Art,'* Chapter V.

The cultural crisis of our times, as one almost gets tired of hearing, is the result of trying to continue into our new and rapidly changing world the habits of thought inherited from the static cultures of the past. The change from the old to the new requires, in a sense, learning to see all over again—a point vividly made by the physicist, P. W. Bridgman: 'The explanatory crisis which now confronts us in relativity and quantum phenomena is but a repetition of what has occurred many times in the past. . . . Every kitten is confronted with such a crisis at the end of nine days.' As Gyorgy Kepes says, 'To perceive a visual image implies the beholder's participation in a process of organization. The experience of an image is thus a creative act of integration.' But, he continues, 'Vision is not only orientation in physical spheres but also orientation in human spheres. . . . In each age of human history man was compelled to search for a temporary equilibrium in his conflicts with nature and in his relation with other men, and thus created, through an organization of visual imagery, a symbolic order of his psychological and intellectual experiences. . . . Today, the dynamics of social events, and the new vistas of a mobile, physical world, have compelled us to exchange a static iconography for a dynamic one.'[9]

Indeed, one can go even farther and say that the consequences of whether or not we revise our habits of vision have a bearing upon our survival, for unless the number of people in Britain, France, Russia, and in our own nation with static and rigid evaluative semantic habits can be substantially reduced, we stand a good chance of being blown to bits.

To all of you, I should like to say in closing, as you go home tonight, whether on the elevated train, the street cars, in an automobile, or dodging your way nimbly on foot, look at the night around you. Look at the world going by of buildings, telephone poles, street lights, automobile headlights, reflections in the window a few inches from your nose. As you stand on a station platform get the visual feel of the train rushing up to you and coming to a stop. As you go forty miles an hour along an arterial drive, examine the number of intricate visual relationships in space-time that you are successfully interpreting. Try to look at all this as if you were a 17-week-old infant or a 9-day-old kitten. Then ask yourself what you would do as an artist trying truly to convey the feel of the typical visual experience of our time. Such an exercise of the imagination will make an artistic modernist out of you quicker than anything else I know.

[9] Kepes, *op. cit.*, p. 14.

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SOME REMARKS ON PSYCHOSOMATIC ISSUES*

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MUCH CONFUSION is being generated about psychosomatic issues in both the popular and medical press. A recent book[1], subtitled 'an introduction to psychosomatic medicine,' promotes misunderstandings by splitting body-mind on almost every page, and presenting an exclusively psychiatric view of a hybrid psychophysiologic field.

This confusion could be expected and predicted if we consider the history of new formulations in medicine and related sciences. Although the organism-as-a-whole theory is twenty-five years old, it is only now beginning to make an impression in medicine, 'psychology,' and allied disciplines.

Special conditions operate in medicine to obscure psychosomatic awareness. The last fifty years have been more fruitful in medicine than the preceding five thousand. During that half-century the germ theory came into its own and basic medical sciences—chemistry, microscopic anatomy, physiology, etc.—made numerous contributions to clinical skill. There were the discoveries of insulin, thyroid, liver extract, modern surgery and anesthesia, anti-serums and vaccines, and recently the sulfa drugs and penicillin. The laboratory prevailed.

Medicine was equated with medical technology, and almost exclusive emphasis was placed (and continues to be) on the physiology and pathologic functioning of various body organs. That is what is meant by the *organic tradition* in medicine.

The sick organ was treated, not the sick man. Patients were considered a collection of organs, and their total functioning neglected.

The few doctors who were concerned about body-mind issues adhered to a rough sort of psychophysiologic parallelism: there were 'organogenic' causes of disease, and 'psychogenic' causes. If the latter were recognized they were relegated to the psychiatrist, who was considered a barely respectable member of the medical profession. More often the practitioner told the patient with evaluational disturbances, 'Just forget about it. There's nothing wrong with you; it's your imagination.'

Yet psychiatry was undergoing a development as significant as the rest of medicine, although the development went unnoticed until after World War I. America's Adolf Meyer spoke out for his psychobiology: recognition of the whole man in his environment. In Europe the great Sigmund Freud, who ranks with Einstein as a maker of revolutionary generalizations, was developing his psycho-

* Expanded from a talk with the same title given before the New York Society for General Semantics, March 22, 1945.

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[1] Hinsie, Leland E., *The Person in the Body*. New York: W. W. Norton, 1945.

analysis: announcing the dynamic aspect of forgotten and hidden evaluational factors and proposing a method for their study.

Later in America, Cannon demontrated the intricate and unitary functioning of the body in fright and pleasure; and in Russia, Pavlov introduced the conditioned reflex method for the study of the effects of stimuli on the animal organism. These and the growth of psychodynamic observations and theories laid the groundwork for psychosomatic research in medicine.

Linguistic Factors

Besides the organic tradition pervading medicine, the other great factor muddling psychosomatic issues is the 'body' *and* 'mind' dichotomy ingrained in our language. For students of general semantics it is unnecessary to elaborate on the elementalistic, static, aristotelian, either-or basis of our linguistic system. We grow up with the system and it is pounded into us every day.

When we do wish to speak about non-elementalistic, dynamic, psychosomatic considerations, we lack the words to do it. That is, we did until general semantics introduced new terms, such as *evaluation* and *abstracting*.

Physicians are not only handicapped by our linguistic inadequacies, but, during four years of medical school and numerous years of practice afterward, they are deluged with organ physiology and pathology. They acquire a 'trained incapacity' to consider psychosomatic formulations. Dunbar puts it this way (1935):

> The majority of medical men today have not reached the point where they can think consciously in terms of major issues in this field or apply them in practice. . . . The medical practitioner today is surprisingly free from consciousness of what he is actually doing.

It is only with great difficult and awareness that physicians (and others) can acquire a psychosomatic attitude. This is demonstrated by the following quotations from expert workers in psychosomatic research. Each is an example of elementalistic thinking:

> The combinations of mental distress and its influences upon the organs of the body is what psychosomatic medicine deals with.
>
> The body tells the mind when something in it is not functioning well . . .
>
> Psychosomatic medicine is a search for correlations between the organic agents of disease and the role of psychological forces in disease.
>
> The problem of psychosomatic medicine must always remain the fundamental relation between psyche and soma. . . .

Overuse of the term *mind*, as exemplified by the book *The Person in the Body* (even the title is elementalistic), is a signpost of body-mind dichotomy. What is needed is a book written about interpersonal relationships without using the term *mind*, an anachronistic term in 1947. Actually such a work has been produced by Maslow and Mittelmann in their *Principles of Abnormal Psychology*.

Medical Education

How psychosomatic knowledge is faring in medical education today has been summarized by Dr. John Romano, new professor of psychiatry at the University of Rochester, in this way:

> Two facts seem clear. The first is that the average graduate of today appears to have less understanding of 'human nature' and of the physiologic and psychologic concomitants of the emotional experiences of mankind,

such as grief, rage, resentment, fear, and anxiety, than have many informed intelligent lay people. The second fact is that a considerable proportion of the patients who come to the physician are sick in varying ways, not because of toxic or metabolic agents, but because of disturbed human relations.

Recently a questionnaire was sent to the medical schools by the American Society for Research in Psychosomatic Problems. The replies revealed considerable confusion among internists and psychiatrists as to methods, scope and goals of modern teaching in psychiatry and psychomatic medicine. The term *psychosomatic medicine* in some cases was taken to represent a new technical medical skill rather than *a point of view* and a *method* utilizing skills of many medical specialties.

An authoritative statement—and from the present point of view, a correct one—about the field of psychosomatic research has been printed in each issue of the journal *Psychosomatic Medicine* since its inception in 1939. An understanding of its implications would dispel much confusion concerning psychosomatic issues. It reads as follows in its latest version:

> The field to which *Psychosomatic Medicine* is devoted is rapidly assuming importance in medicine and the related sciences. The traditional body-mind dichotomy, while now less present in medical thinking, is not eradicated from language. Expressions which, during the last decade, have gained increasing prominence in medical literature, such as the organismal theory, the patient as a whole, psychosomatic problems, psychophysiology, psychobiology, were all attempts to avoid the artificial division of the psychological from the physiological. It is now realized that the major problem is not to find the term or label to indicate the essential unity of the organism, or to engage in philosophical discussions about monism, dualism or parallelism, but to develop practical methods for dealing clinically and scientifically with the organism as a whole. Although the organism is a unit, fundamentally different methods have been developed for the observation and management of the psychic and somatic functions. This fact is the real reason for the use of the term psychosomatic, not any differences of opinion about the essential nature of the organism.
>
> The ability to deal with the psychic aspect of an illness, or with the patient as a person, has been called the art of medicine in contradistinction to the science of medicine. But this association of ideas has tended to preserve a dichotomy. Most physicians would agree that there is an art and a science for dealing with physiology as well as psychology. . . .
>
> Psychosomatic medicine is not a medical specialty, parallel with internal medicine or psychiatry, but an approach which might be applicable to almost any medical, psychological or physiological problem.

Controversy

Controversy over whether psychosomatic considerations in medicine are new or old has been part of the present confusion. Some maintain that psychosomatic medicine is old stuff and say that the old family doctor practiced it. It is true that the family practicioner, now almost extinct, knew his patient's way of life and took that into account in his diagnosis and treatment. However, he had no theory and worked by fortuitous intuition.

What now goes under the term psychosomatic medicine does have theories of personality functioning—based on freudian psychodynamics. It is interesting to note that the great impetus to psychosomatic research came more from psychoanalysts, principally Flanders Dunbar and Franz Alexander, than from adherents to psychobiology who had been preaching an organism-as-a-whole approach since 1900 but who lacked dynamic theories and methods. This is a confirmation of the statement that without psychodynamics there would be no psychosomatic medicine.

Consider the following case-histories:[2]

CASE ONE: A successful businessman suffered from frequent pains and burning sensations in the region of his stomach. Medical and laboratory examinations, including X-ray studies, failed to show any abnormality. Although no ulcer was detected, this man was found to be of the same 'psychological type' as patients who had ulcers. He was active, independent, constructively aggressive, and by his own initiative had built up his own business, of which he was sole executive. He was a self-made man and a lone wolf.

He felt that others continually depended upon him for support, help and advice, but he never needed to receive anything from anyone. He could never allow himself to do so because it would make him feel inferior and a sissy. Independence, responsibility, and giving were the core of his evaluational scheme. He couldn't even stand someone else paying his luncheon check.

Analysis, however, revealed desires opposing independence. Occasionally he thought, 'No one ever does anything for me, why should I do anything for them?' But he maintained he didn't want or expect anything from others.

When he heard a radio skit in which someone spontaneously went out of his way to help another, tears streamed down his cheeks. He was thrilled by a play in which a wife laid out her husband's slippers, and ministered to his every desire. In his dreams he was in his boyhood home being cared for by a maternal woman. Actually his parents had been unusually cold emotionally. Christmas was not even celebrated.

The patient had repressed this situation, and one could say he had adopted this 'basic assumption': 'I don't want love anyway. Besides it isn't good; having it makes you a sissy. I have no such wishes. I am above love. I am strong and independent, do everything for myself, and ask nothing of any one.'

But behind his independence and drive was a little boy's craving for maternal love and care. And his stomach pains occurred at times when these cravings were especially frustrated—by excessive demands and responsibilities, by disloyalty of a friend, by a falling out with his wife, and by occasional business trips when he left home and friends.

Our earliest experiences concern food taking, yet not only do we receive milk at the breast, but love and security. To an infant food and love are physiologic necessities and are inseparable, so it is not strange that an individual constantly wishing affection and care responds organismally by readiness to receive food. He is always prepared to receive food: his stomach is constantly secreting gastric juice, especially acid, and is hypermotile and flushed with blood.

It is believed that such chronic physiologic overactivity accounts for the symptoms of chronic gastritis and eventually

[2] This and the next case are adapted with slight changes from Saul, Leon J., 'The Place of Psychosomatic Knowledge in Case Work,' *The Family*, 22:219, 1941.

leads to peptic ulcer, although there are several unknown factors involved in the steps from chronic hyperacidity, hyperemia, and hypermotility to erosion of the stomach lining. However, in a high percentage of cases the typical personality profile, as sketched above, is found in sufferers from ulcer.

Nonetheless the total organism-environment continuum must be studied, as the following cases illustrate.

CASE TWO: This man had been indulged for years by a devoted mother, was not a leader, and lacked the driving ambition so often seen in ulcer cases. He married a wealthy, ambitious, capable woman who devoted herself to her own career and sorely disappointed him in his expectation of an indulgent mother substitute. He felt driven into competing with her and tried to make a showing for himself by strenuous efforts in business.

But unlike most ulcer cases he detested it. He developed recurrent stomach pains after meals, which persisted for ten years when an ulcer was found. Soon afterward, he was divorced, remarrying a woman who was in many ways the opposite of his first wife. She liked to cook and take care of the home. He no longer had to compete, and his symptoms disappeared.

CASE THREE: A twenty-five year old private with eight months service was referred to an army psychiatrist because he had severe backache for which no abnormality of bone, muscle, or nearby organ could be found as the cause. History revealed that his father had deserted the family when the patient was two, and as soon as he could understand, he was called the man of the house. His mother earned a tiny income which was barely enough to live on. When he was sixteen he assumed full support of his mother and sister, although the sister soon married and left home.

His mother had lectured him since childhood and restricted his activities in a stern way. Although he was grown she attempted to choose his clothes and pamper his palate. He vowed he would never leave her, even when he married, because to do so would show selfishness. When she irritated him he hid his anger and walked out of the house. He was not even aware that he was angry.

The greatest event in his life—one he had dreamed of for years—was the purchase of a car. Now he could come and go as he wished and take long drives out of the city. When he was inducted into the Army the war was over. He soon developed severe headaches and back pain; yet he persisted in his duties although the infirmary physicians found nothing to relieve his suffering.

He felt the Army was a vast prison. He never 'griped' to his fellows or told his feelings to anyone.

In the hospital he was led to a realization of his constant anger at the Army, and of the similar feelings he had toward his mother. He discovered he was always angry but he was not aware of his anger or its occasion. He described how an angry man looked and felt and found that he had described himself—even to the flushed face and neck.

His back muscles were unremittingly tensed and he saw that this accounted for his backache. His headaches were of 'tension' origin too. After three weeks of daily interviews his symptoms abated but did not disappear, and he was returned to duty.

This soldier's perpetual resentment and rage eventuated in painful tenseness of his back muscles, in severe headaches, and in crowded, confused 'thinking.'

Alexander's Concepts

Alexander[3] has proposed three fundamental notions for psychosomatic research which it would be illuminating to discuss, although shortly, with these cases before us.

'When we speak of psychogenesis [the first notion] we refer to physiological processes . . . which can be studied by psychological methods because they are perceived subjectively in the form of emotions, ideas or wishes.'

It will be noted that Alexander has brought physiologic *processes* into his description, which taken in its entirety (not quoted here) is an organism-as-a-whole description unfortunately put in old elementalistic terms. (And when Alexander speaks of 'emotions and wishes' we know from his work that, by extension, he brings in environment.) Those acquainted with general semantics would certainly propose a derivative of evaluation as a more methodologically sound substitute term for psychogenesis.

'We restrict hysterical conversion [the second [notion] to symptoms of the voluntary neuro-muscular perceptive systems . . . [constituting] symbolic expression of a well-defined emotional content—an attempt at relief.' Examples of conversion symptoms are hysterical loss of voice, hysterical paralysis or hysterical loss of sensation.

For example: a woman developed an anesthetic area over her hip where her admirer had accidentally touched her. This represented the symbolic solution of an unconscious conflict. After all, if she had no feeling over her hip, how could she realize he had touched her?

In contradistinction to conversion, Alexander places the notion of 'vegetative neurosis.' 'Here the somatic symptoms are not substitute expressions of repressed emotions but are normal physiological accompaniments of the symptom. . . . The chronicity of an emotional tension alone is what makes such a condition morbid.'

The three cases cited are examples of 'vegetative neuroses' — physiologic dysfunction concomitant with constant or periodically recurring evaluational reactions. In the first two the evaluational reaction was a yearning for infantile love and dependence. In the third case the prevailing organismal reaction was rage.

Conversion reactions and psychophysiologic dysfunction reactions should be understood as opposite ends of a continuum between which fall the symptoms considered in psychosomatic research. A very fine paper,[4] which I feel is a classic contribution to psychosomatic knowledge, contrasts hysterical fainting and vasodepressor (physiologic) fainting, and demonstrates this point nicely.

Alexander's third notion is specificity, the assumption that accompanying each type of psychosomatic disorder there is a different and specific 'personality structure' (system of basic assumptions). Specificity has already been partially demonstrated in several psychosomatic disorders.

Significance

Those who have been trained in general semantics and have acquired an organism-as-a-whole-in-environment attitude will experience no difficulty in their comprehension of psychosomatic knowledge. For, roughly speaking, general

[3] Alexander, Franz, 'Fundamental concepts of psychosomatic research: psychogenesis, conversion, specificity,' *Psychosomatic Medicine*, 5:205, 1943.

[4] Romano, John, and Engel, George L., 'Studies of Syncope III: Differentiation between Vasodepressor and Hysterical Fainting,' *Psychosomatic Medicine*, 7:3, 1945.

semantics represents a generalized 'psychosomatics,' and the major assumptions of psychosomatic medicine—multicausality and the organism-as-a-whole-in-environment formulation—are integral aspects of general semantics.

Training in general semantics and consistent application of its methods frequently brings a reduction in general anxiety. Awareness of psychosomatic considerations can result in understanding everyday tenseness and anxiety as they are organismically experienced. However, when psychosomatic symptoms become grave, they represent medical problems that should be handled by expert physicians.

While the traditional elementalistic outlook is widespread among the general public and the medical profession, the significance of psychosomatic considerations in medical practice and theory is daily becoming more evident. Dunbar reports that of 1600 routine serial admissions to New York's Presbyterian (general) hospital, eighty percent were shown on superficial examination to have psychiatric (evaluational) factors involved in the causation or aggravation of their condition.

Additional studies have shown this figure to prevail in other hospitals. Dunbar points out that the great burden of disabling and chronic disease—manpower wastage—represents a psychosomatic problem of the greatest magnitude. Selective service reveals that of the men between 18 and 37 examined, over 5½ million were rejected as of the middle of 1945; forty percent of rejectees—nearly 2 million—fell in the group of 'personality disorders.'

When general semantic formulations become part of general education, and furthermore are incorporated in the training[8] of physicians, then the psychosomatic evaluational factors present in so many illnesses will not go untreated. Search for evaluational factors will be routine in every medical examination.

[8] Korzybski has written me (April 15, 1947) as follows:

'. . . I wonder if the linguistic device of a hyphen in psycho-somatic would not be the solution [of the unbelievable complexities of psycho-somatic issues of which the majority of physicians never dreamt]. There is such a thing as the implications (automatic consequences) of the structure of language.

'If we spell "psychosomatic" without a hyphen, by implication we hide the complexities and once more we fool ourselves by making a verbal entity of eventual simplicity. In reality that fictitious simplicity turns out to be an infernal complexity. Just by eliminating the hyphen, we dump on others and ourselves psycho-logical traps, which involve endless complexities of the old two-valued "cause-effect" in a world where there "ain't such animals." . . . emphasize the hyphen, as a connecting factor of issues which macroscopically are not connected.'

Suggested Books

Binger, Carl: *The Doctor's Job.* New York, W. W. Norton, 1945. Reviewed in *ETC.*, 2:72, 1945.

Dunbar, Flanders: *Psychosomatic Diagnosis.* New York, Hoeber, 1943. Reviewed in *ETC.*, 2:184, 1945.

Maslow, A. H., and Mittelmann, Bela: *Principles of Abnormal Psychology.* New York, Harpers, 1941.

Ribble, Margaret: *The Rights of Infants: Early Psychological Needs and Their Satisfaction.* New York, Columbia, 1943. Reviewed in *ETC.*, 4:64, 1946.

Saul, Leon J.: 'Physiological Effects of Emotional Tension,' in Hunt, J. McV. (ed.): *Personality and the Behavior Disorders* (2 vols.). New York, Ronald press, 1944, vol. 1.

GENERAL SEMANTICS AND THE SCIENCE TEACHER*

WENDELL JOHNSON

JUST WHAT science teachers teach is not always entirely apparent. What they could teach is something else again, something worth talking about, something that is doubtless worth teaching: they could teach science as a general problem-solving method, as a basic life orientation. The possibility is exciting. Just what would it involve?

It would seem to involve, first of all, a reasonably clear grasp by the teacher of the fact that the word *science* can be used in various ways, and of the various ways in which the word might be used. One of the more intriguing aspects of faculty club room bull sessions is to be glimpsed in the relative enslavement of physicists, chemists and other 'scientists'—to say nothing of historians, philosophers and other 'non-scientists'—by their accustomed verbal definitions. Among the eight semantic wonders of the world is to be included the apparently interminable debate over what science *is*. The furors created among the six blind men by the elephant, and among modern critics by Picasso and the late Gertrude Stein, hardly rival in turbulance the verbal whirlwinds generated among physicists, for example, by the assertion that psychology *is* scientific, and among psychologists by the assertion that it *is* not. The one question that seems effective to some degree in stilling such verbal typhoons momentarily — on occasion—is this: Precisely how does one deal with a problem non-scientifically? The difficulties we have in defining *science* are as nothing compared with the sloughing about we indulge in when trying to specify how not to be scientific. In fact, it would appear that almost the only examples of quite thoroughly non-scientific behavior are to be found in the more bizarre case histories in textbooks of psychiatry and abnormal psychology.

It is difficult to believe that the need, indicated by such terminological wrestling, for even an elementary acquaintance with semantics is as widespread as it undeniably seems to be. 'The uncritical assumption of mutual understanding,' pointed out by Professor Quine of Harvard, is apparently far more pervasive, and produces more devastating confusion, than can easily be appreciated. The degree to which each one of us takes for granted that everyone else is familiar with the nooks and crannies of his own 'lonely room' of words and meanings is a formidable barrier to communication. It is this semantic provincialism and individualism that underlies much of the seemingly unaccountable disagreement and general futility of formal and informal discussion. We waste our time and unravel our nerves contending that the speaker 'isn't defining his terms correctly' and 'can't speak English'—'correctly' and 'English' referring to our own pet, and

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unavoidably private, definitions and ways of using words.

One of the more elementary questions in this connection, a question important to science teachers, has to do with the purposes served by definition: What is a definition for? There are several possible answers. Perhaps the one that would be given most commonly is that a definition specifies what a word refers to, and so serves the purposes of understanding and agreement. Doubtless, there are few who would not accept this statement, at least in principle—and if permitted the qualification that very often definitions do not seem in practice to serve the indicated purposes. In any event, however, the statement hardly exhausts the subject. It is too large a subject to be exhausted, here at least, but there is one other answer to be given to the question that will be useful to us in the present discussion: A particularly important function of a definition is to be seen in the effects it has on those who use it. These effects can be limiting, inhibitive and restrictive. On the other hand, they can be broadening, facilitative and stimulating. *Music,* for example, can be defined in such a way as to deaden one's capacities for enjoying anything but Beethoven—or Spike Jones. Or it can be so defined as to stimulate one's curiosity and exploratory drives and prepare one to enjoy *both* Beethoven *and* Spike Jones.

As with the word *music,* so with the word *science.* It can be defined in such a way as to narrow one's interests, restrict one's activities, and limit the usefulness and value of one's 'science.' One can, and many people do, operate with a definition of *science* such that it never occurs to them that problems which they classify as 'moral,' or 'ethical,' or 'religious,' or 'personal' could be dealt with scientifically. The term can be defined, however, in ways that encourage a scientific approach to an ever widening range of situations. If teachers of physics believe that science provides an effective problem-solving method, one might hope that they would react with some enthusiasm to definitions of *science* that would extend its usefulness as much as possible. Such definitions provide illuminating slits in the iron curtain of traditional professional exclusiveness and rigid departmentalism, slits through which one can glimpse the possible scientific civilization of the future.

For practical purposes, one can distinguish at least five general meanings of *science.* The term is frequently used, particularly in newstand magazines and in movies, to refer to certain techniques, usually involving the use of specialized apparatus. The more Rube Goldbergish the apparatus, the more 'scientific' it is, supposedly. The men who operate the apparatus and apply the techniques are said to be scientists. Almost always, however, such men might more usefully be designated as technicians. Many a good technician would be thoroughly immobilized if asked to give a lecture on the basic principles of scientific method. As a means of making a useful distinction I have proposed the term *tinkerniquer,* in order to differentiate the laboratory workers who 'tinker' with techniques from the scientists who plan their labors and interpret their findings. The distinction is by no means intended to be derogatory. It is intended merely to facilitate a useful differentiation. The distinction is pointed up somewhat by the fact that Einstein has spent little, if any, of his working time with apparatus.

Science is also used sometimes to refer to what are called 'the sciences.' It serves, thus, as a kind of verbal wedge, splitting off physics, chemistry and a few other academic areas, from all other areas. A considerable proportion of word-workers

devote themselves to driving this wedge here and there, according to their acquired preferences, into the tree of knowledge. Used as a wedge in this way, the word *science* tends to make for statements, monographs and books which discourage attempts to behave scientifically outside certain lecture halls and laboratories. They discourage communication and comradeship as between those who work in 'the sciences' and those who toil in 'the humanities' or 'the arts.' The effect of this verbalistic splitting is individually and culturally schizophrenic. The effect is seen in the physicist who steps out of his laboratory and into the sixteenth century each afternoon at five o'clock. It is seen no less in the historian who, convinced that he is in no sense a scientist, abandons himself with various and sometimes curious effects to what he calls the art of story-telling.

Science is used in still another way as referring to 'scientific knowledge.' This implies that there can be, and actually is, 'nonscientific *knowledge.*' One must wonder what the purveyors of 'scientific facts' would recognize as 'unscientific *facts.*' If 'unscientific facts' is a contradiction in terms, then 'scientific facts' is a redundancy. Outside this semantic eddy, the definition proceeds with its cargo, supplying the writers of popular magazine pieces, the ads, the believe-it-or-nots, and high school and college textbooks with a never-ending assortment of more or less reliable items of information about everything from fossils and fungi to tea and tumors. From this point of view scientists are essentially hucksters, dispensing oddments of knowledge in sets or by the piece. This quiz-show conception of science is hardly calculated to give the students who use the textbooks or the laymen who read the digests any very workable notions as to where the 'facts' come from, the methods of obtaining and validating—and revising—them, or the broad significance of their implications as they ripen and expand in the yeast of theory. It emphasizes the results of science at the expense of method, and without providing for systematic evaluation of the results themselves.

There is also the definition of *science* that focuses attention on theory, as such. Science, as viewed from this angle, is a body of hypotheses, theories and laws. Well developed scientific theories necessarily function on relatively high levels of abstraction, and effective understanding of them presupposes a familiarity with mathematics, with the principles of theory construction, and with the data basic to any specific theory being considered. Few people are qualified by training or experience to evaluate such theories, to say nothing of formulating them, and if they are given to understand that they are what *science* mainly refers to, their interests in it can be expected to be slight at best. This is not to say that the majority of people are inherently incapable of appreciating the theoretical aspects of science; it is only to say that our customary schooling, even our science courses, seem not to provide the necessary training.

There is, however, a definition of *science* which, in contrast to those sketched above, tends strongly to emphasize the generalization of science into practically all areas of human endeavor. This is the definition which emphasizes the methodological aspects of science, presenting it as a problem-solving method. The basic method that we call scientific would appear to be essentially the same in all the so-called sciences—and outside the recognized sciences—and is to be clearly differentiated from specific technologies and narrowly applied techniques. Even precision apparatus, rigorous quantification and experimental controls are not *essential* to

scientific method; they are *refinements* of it. The basic method can be applied to any sort of problem whatever, inside or outside the laboratory. In this sense there can be such a thing as scientific living. It is this basic method that science teachers *could* teach—and it is invigorating to contemplate the possible consequences of teaching it well to the succeeding waves of incoming students that threaten perennially to make the dry academic beaches damp with promise.

Science, from this point of view can best be regarded as a general orientation, to be contrasted with what might be called a prescientific orientation. This contrast may be expressed in the following broad contrasts between the prescientific and scientific orientations:[1]

PRESCIENTIFIC, I. Fundamental notion of the static character of reality. A static reality involves essential constancy (there is nothing new under the sun). Main attention is given to similarities; differences are minimized or ignored. Consequently, the individual is not especially important except as he represents a type.

SCIENTIFIC, I. *Fundamental notion of the process character of reality. A process reality gives rise to a never-ending series of differences. As much or more attention is paid, therefore, to differences as to similarities. As one important consequence, the individual is regarded as an individual, not merely as an example of a type.*

PRESCIENTIFIC, II. Rigidity, or conservatism, the tendency to maintain established beliefs and habits regardless of changing conditions, is fostered by these basic notions of static constancies. Thus, traditions are cherished, and the authority of age and precedence is extolled, seldom challenged; experimentation is discouraged. The Old Man is honored and obeyed. As a result of all this, individual infantilism and social retardation are fostered.

SCIENTIFIC, II. *Adaptability, a readiness to change as changing conditions require, is fostered by these basic notions of process differences. Thus there is a tendency to challenge authority systematically; to experiment, to test traditional beliefs and customs against actual observation and experience. The Old Man is respected but evaluated critically. As a result of this, individual and social maturity is stimulated.*

PRESCIENTIFIC, III. The basic method of problem-solving, which we call authoritarian, involves mainly the practice of abiding by advice obtained from some vested authority, such as a parent, teacher, priest, or judge. Authority sometimes resides also in a book or code of rules. The pronouncements of such authority are not to be revised. This authoritarian method works in practice to maintain unchanged the traditional beliefs, customs, and rules of conduct. If problems are not solved, they are 'explained' in terms of 'fate,' or 'nature,' or the 'supernatural;' and toward the *language* used in such 'explanations' there is a dominant attitude that is naive and unreflective.

SCIENTIFIC, III. *The basic method of problem-solving, which we call scientific, consists of four main steps; (a) the asking of questions that direct one's (b) observations so as to (c) answer the questions clearly in such a way as to test one's beliefs or assumptions, (d) which are revised accordingly. Of these four, three (a, c, and d) involve mainly the use of language. This scientific method works in practice toward the continual improvement of specific techniques, refinement of beliefs, and 'modernization' of customs and rules of conduct. If problems are not*

[1] For a more extended statement see Wendell Johnson, *People in Quandaries*. New York: Harper & Brothers, 1946.

solved, new theories and methods are devised to solve them.

PRESCIENTIFIC, IV. The language of a prescientific orientation is designed to control behavior by virtue of the vested authority it represents. If it is not clear, a properly appointed authority will interpret it, and his interpretation is to be believed. The validity of authoritarian pronouncements is not to be questioned. Statements of assumption and statements of fact tend to be regarded as the same.

SCIENTIFIC, IV. *The language of a scientific orientation is designed to be factually meaningful, directly or indirectly, and clear and valid. It is intended to satisfy two important tests: 'What do you mean?' and 'How do you know?' Moreover, assumptions are sharply differentiated from statements of fact.*

PRESCIENTIFIC, V. Prescientific language tends to make for questions that are frequently vague and quite often meaningless factually. The observations needed to answer the questions, and the procedures needed to make the observations and to indicate their degree of reliability, are neither specified nor clearly implied. Attempts to answer such questions give rise to misunderstandings and disagreements, to misinformation and misleading theories, with the result that predictability and foresight are achieved slowly, or not at all, and individual and social maladjustments are thereby fostered.

SCIENTIFIC, V. *Scientific language is oriented around factually clear, answerable questions. Terms are defined operationally by reference to relevant investigative procedures. Vague or meaningless questions are abandoned as being misdirective of human energy. On the principle that the terminology of the question determines the terminology of the answer, only clearly stated questions are tolerated. Because of this, mutual understanding and agreement are facilitated, predictability and foresight are improved steadily, and individual and social adjustments are thereby fostered.*

PRESCIENTIFIC, VI. It is realized only vaguely, or not at all, that every statement conveys information about the speaker as well as information about whatever the speaker may seem to be talking about; and the degree of self-reference is largely ignored in evaluating the statement's factual significance.

SCIENTIFIC, VI. *It is realized that every statement conveys information about the speaker as well as information about whatever the speaker may seem to be talking about; and the degree of self reference is reckoned in evaluating the statement's factual significance.*

PRESCIENTIFIC, VII. In a prescientific orientation, there is a marked tendency to speak as though with the voice of another (ventriloquizing). For example, the voice of The Law is not recognized as the voice of the Judge himself. The speaker tends to ventriloquize both unconsciously and deliberately (as in the planned use of 'ethical proof'). Only the more artful and deliberate ventriloquizers seem to realize that, after all, it is their own evaluations that they are expressing. Students are encouraged to take for granted the validity of statements made by their teachers and by the authors of their textbooks.

SCIENTIFIC, VII. *In a scientific orientation, there is little or no tendency to speak as though with the voice of another (ventriloquizing). For example, the voice of The Law is recognized as the voice of the Judge himself. The speaker tends not to ventriloquize either unconsciously or deliberately; he realizes that what he expresses are his own evaluations—even though he may quote another man's words. Students are encouraged, and are shown how, to check the validity of statements*

made by their teachers and by the authors of their textbooks.

PRESCIENTIFIC, VIII. Accurate prediction, or foresight, is not a particularly well-recognized objective in a prescientific orientation. At least theories and specific statements are not evaluated primarily in terms of their usefulness in making predictions. In a prescientific orientation there are, strictly speaking, no scientific submicroscopic theories; there are, rather *beliefs* regarding the 'supernatural,' for example. These tend not to be changed, because they are considered not as theories but as statements of fact. Faith in these beliefs and obedience to the authority which represents them — obedience expressed by participation in prescribed rituals, for example—are prized as the means of control over natural and human events.

SCIENTIFIC, VIII. *Accurate prediction, or foresight, is a clearly recognized objective in a scientific orientation. Theories and specific statements are evaluated primarily in terms of their usefulness in making predictions. The value of a scientific submicroscopic theory (such as a molecular theory of matter) lies in the accuracy of the predictions which it makes possible. Changes in such theories, as also in theories that do not clearly involve submicroscopic constructs, are made in the interests of more adequate prediction. Theories of high predictive value are prized as the means of control over natural and human events.*

Viewed in this way, as contrasted with a prescientific approach to situations and problems of whatever kind, science comes alive abundantly with personal and social implications. It overflows the laboratory dikes and floods the entire academic landscape with waters of unsuspected fertility. Nor does it dry up at the boundaries of the campus. Science, as defined here, provides ways of approaching political, international, ethical, moral, industrial and personal problems, as well as technological ones. As Professor S. A. Nock[2] has said, it is not what he works with but the method by which he works with it that distinguishes the scientist.

One may, of course, insist that this is not the definition of *science* to which one is accustomed—but such a statement would be appropriately followed, it might reasonably be expected, by a defense of its relevance to some significant proposition. Otherwise, the statement would be properly regarded as autobiographical, or self-assertive, and one would find it more or less interesting, depending on one's personal relationship to its author. In the meantime, it is to be considered that the definition advanced above has, like any other definition, an effect on those who operate with it. The effect in this case might be expected to have the advantages, so far as problem-solving is concerned, that we have come to associate with the use of scientific method in those areas where it has so far been applied.

It is not to be assumed that most teachers of physics—or of chemistry, for example—have either the qualifications or the time to train their students in the specific details of the generalized use of scientific method. It is to be assumed, however, that they are, or should be, very well qualified—and that they do have the time and the opportunity—to present science as a method which can be applied far beyond the boundaries of their own restricted fields. It is reasonable, moreover, to expect them to make the most of this opportunity. Another generation of technicians and engineers, with technological reflexes, incompetent to assist in dealing with the social problems which

[2] Nock, S. A. 'The Scientist and Ethics.' *Ethics*, 1943-44, 54: 14-28.

their technical competence creates, is indeed a terrifying and demoralizing prospect. The science teacher who views it with schizophrenic indifference is the product of a kind of education that should, in the interests of public welfare, be abandoned. Most of the research workers who served as midwives to plutonium were sufficiently shocked when they saw the baby to offer their services as wardens and guards. Some of them even volunteered to drown it. Those of us who still think it is a cute baby might well begin our re-education by studying ourselves in a mirror for three hours a day, if we can stand it, until significant changes appear. If it does not take too long there may still be time.

So long as we continue to change the world we live in by applying scientific method to our material problems, we can hardly anticipate anything but increasing personal and social maladjustment if we continue to cherish and preserve our traditional prescientific ways of living in that world. In space-time terms—that is to say, in terms of the time it takes to get from one place to another, or to deliver a rocket bomb from one nation to another, or to send a message around the earth—we have reduced the former expanse of the globe to the size of a small state, scarcely larger than Rhode Island. Into this tiny and steadily shrinking space we are packing the age-old hatreds and conflicting loyalties that once, like the submicroscopic particles of the uranium atom, were comparatively harmless because they were so far apart. But just as we released the fury of the uranium atom by bringing enough of them close together fast enough, so we are threatening to unleash the demolishing fury of the 'culture atom' by compressing the peoples of the earth into compact space-time proximity so rapidly that they are unable fast enough to neutralize their accustomed prides and prejudices.

The required neutralization process has been facilitated so slightly and slowly, if at all, by our traditional prescientific institutions and methods of social control and individual development, that only an irresponsible optimist would continue to place his trust in them. A generalized scientific orientation, imparted intensively to the young—and to the middle-aged and old if possible—offers at least a promising alternative, a gambler's chance, perhaps. The scientific world we have created might, with good fortune, be held together by people who are as scientific about themselves and their social relationships as they are about their industrial and military endeavors. But people who are, by cultural tradition and intimate family and community indoctrination, predominately prescientific can hardly be expected to develop a scientific orientation to personal and social problems unless they are given the necessary training. This means there must be teachers who can train them. If science teachers can function as teachers of science as here defined, there is some reason for hope. Certainly, little assistance—and probably considerable frustration of our efforts—is to be looked for from teachers in those areas where prescientific ways and points of view are fostered and fiercely defended.

Those science teachers who find in these remarks something to which they can respond with enthusiasm can find, also, in general semantics a reasonably systematic and comprehensive rationale and practical know-how to assist them in translating their enthusiasm into action.[3]

Anyone significantly interested in knowing about general semantics is not

[3] The original source book of general semantics is Alfred Korzybski's *Science and Sanity: An Introduction to Non-Aristotelian Systems and General Semantics*, Lancaster, Pa.: Science Press, 1933, revised edition, 1941.

to be satisfied by a brief definition of it. A short statement, however, might serve a useful purpose by indicating at least roughly the essential character of the problems with which general semanticists are particularly concerned. They are concerned, first of all, with the sort of problems that have been discussed in this paper, as pointed up, for example, in the contrasting characterizations of scientific and prescientific orientation presented above. General semantics amounts to a generalized and practical formulation of science as method, with due emphasis on the language of science. In teaching general semantics one teaches scientific method in such a way as to make its general value apparent. And to a considerable degree one does this by making clear the differences between the ways in which scientists use language and the ways in which the 'average man'—and, by sharper contrast, the 'mentally' ill person—uses language.

The word language is being used here in a broad sense—not merely, not primarily, in the sense of grammar or logic. General semantics is not 'the study of words' or 'the study of meaning,' as these terms are ordinarily understood. It is more nearly correct to say that general semantics is concerned with the assumptions underlying symbol systems and with the personal and cultural effects of their use. It is concerned with the pervasive problem of the relation of language to reality, of word to fact, of theory to description and of description to data—of the observer to the observed, of the knower to the knowable. It is concerned with the role of language in relation to predictability and evaluation—and so in relation to the control of events and to personal adjustment and social integration.

As a frame of reference, an organizing system, general semantics may be described as a set of basic premises, working principles and practical techniques. The major premise, that of non-identity, summarizes the proposition that no two things or experiences are identical in all respects, and that no one thing stays the same in all respects. With certain systematic restrictions, it is to be contrasted with the basic Aristotelian premise, or law, of identity, A is A. In comparable symbolism, the non-Aristotelian premise of non-identity may be stated as A_1 is not A_2, or A_{1940} is not A_{1930}. The generalized formulation of non-identity is to be made in terms of the process of abstracting, a process to be described in terms of the non-symmetrical relationships as between levels of evaluation or experience—levels of abstraction.

As originally formulated by Korzybski, and adapted to their various purposes by other general semanticists, the basic distinction is that between the non-verbal and verbal levels of abstraction. The non-verbal levels are further differentiated into the macroscopic and microscopic direct experience levels, on the one hand, and the submicroscopic levels of inferential data (atoms, molecules, electrons, for example), on the other. The verbal levels are differentiated into the first-order verbal level of naming and description and successively higher levels of inference. Within this structural framework, then, abstracting is viewed as a process of organizing, ordering, or relating the data of experience by leaving out or disregarding more and more experiential details as one proceeds from lower to higher levels. A consciousness of abstracting, the principal objective of training in general semantics, functions as an awareness of the details left out, and left in, and of the organizing principles (assumptions, purposes, etc.) by means of which this selective process is governed and by means

of which the selected data are ordered. Abstracting, therefore, is seen as the generalized mechanism underlying evaluation. Within this framework, the premise of non-identity assumes a form that may be stated variously: $level_1$ is not $level_2$, or the word is not the object, or inference is not description, or the perceived object is not the construct or inferential event, etc.

Such matters as the self-reflexive character of language and of abstracting generally (abstracts of abstracts, statements about statements, evaluations of evaluations, etc.), the self-projection involved in observation and in verbal statement, the dependence of a word's 'meaning' on the relative level of abstraction on which it is used, the self-corrective potentialities of the process of abstracting, and the problems of symbolization and communication may be meaningfully treated in terms of the process of abstracting as formulated in general semantics. These are matters of basic importance in a consideration of science as method, whether in its restricted applications or its generalized sense.

The working principles of general semantics may be summarized as those of probability (or uncertainty), which facilitates a relativistic, as opposed to an absolutistic, orientation; symbol reaction (or conditionality), which is directive of reactions governed by an awareness of the difference between a symbol and its varying non-verbal level reference (or lack of such reference), between an inference and its supporting, or refuting, descriptions, between an object or event and its relational implications, etc.; and extensionalization, which embodies and generalizes the operational principle stated by Bridgman[4] and others.

[4] Bridgman, P. W. *The Logic of Modern Physics*. New York: Macmillan, 1932.

On the basis of these principles, a considerable number and variety of behavioral and evaluational techniques have been devised and applied by Korzybski and others. Many of these are linguistic techniques designed to make the language of everyday accord more fully with the distinctive features of scientific language. Others are non-verbal modes of application of the semantic principles.[5]

These premises, principles and techniques, which define the basic framework of general semantics, constitute a generalized formulation of science *as method*. It is the sort of formulation which makes scientific method teachable in a non-technological, general education, liberal arts sense. In the condensed form in which it has here been sketched, it may possibly appear a bit formidable from the point of view of a college freshman. This is by no means the case, however, when it is expanded and explicated in a sizeable book or in a three-hour semester course. It is to be hoped that no reader will be satisfied with this digest or sketch; it is meant to be only suggestive, an expository *hors d'oeuvre*. From the brief and general statements made here the science teacher may be able to get at least a rough indication, however, of what he can get from more comprehensive sources.

This article will have served its intended purpose if it arouses in the science teacher an enlarged sense of his social responsibility—and of his opportunity to meet it more adequately. When viewed broadly as a generalized method of problem-stating and problem-solving, as a kind of life orientation, science expands enormously in social significance. The science teacher should get both comfort and increased motivation from the proposition

[5] For a description of several of these techniques see Johnson, *op. cit.*, particularly Chapter 10.

that what we need, as individuals and as a world society, is not less science but more of it. Sanctuary is not to be found by fleeing back to the Middle Ages, but by hurrying ahead into the future in order to catch up with ourselves. Our left foot is dragging, so to speak, and we are far more likely to regain our balance—or to achieve it for the first time in history—by thrusting the left foot forward than by trying to pull the right one back. Having used science to transform the world in which we live, we face the sheer necessity of using science to transform us who live in that world. And general semantics is designed to facilitate the urgent transformation.

A NON-ELEMENTALISTIC APPROACH TO PSYCHOLOGICAL DATA

N. H. PRONKO*

WITH THE modern trend toward co-operative research in science and applied fields, the sensitive student of general semantics may well expect from, as well as look to, the psychologist for a realistic approach toward behavioral data. Perhaps, in the past, traditional mentalistic and behavioristic systems have failed to yield help, the former because of its anti-scientific assumptions and the latter because of its elementalistic formulation. And yet within recent years there have been systematic developments [1] which can furnish a helpful orientation toward the behavioral phases of every-day happenings. It is the purpose of the present paper to sketch in broad outlines the foundations of a psychology that will find application in general semantics and will permit integration with the data of that discipline.

A fundamental postulate of such a modern system regards behavioral facts as of a piece with other happenings on this earth. In other words, the reachings, talkings, walkings, 'thinkings,' 'imaginings,' etc. of people are just as *natural* as an object-in-gravitational-interaction-with-earth, one chemical substance-interacting-chemically-with-another, stomach-digesting-food, etc.[2]

In greater detail, a behavioral event is described as involving centrally the *mutual* interbehavior of an organism and stimulus object. The unit called the organism does something to the stimulus object while the object, on the other hand, stimulates the organism to some kind of 'activity.' Since there is no 'psychology' to study unless both participate, it is nothing less than their *joint* interaction that constitutes the psychological event. Thus, from observation to interpretation or construction and further formulation of hypotheses the two are held together indissolubly. Therefore, absolutistic cause-effect thinking is out. Instead, one studies in relativistic fashion an integrated field process of many inter-related factors; therefore, there is no glorification of the organism or of its 'special' parts above the stimulus object, although such verbal splitting of a unitary event is still a feature of an older elementalistic psychology to be discussed below.

In addition to the organism and stimulus object, one must take account of such setting or situational factors as presence or absence of other persons or objects.

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[1] J. R. Kantor, *A Survey of the Science of Psychology*. Bloomington, Indiana: Principia Press, 1933.

[2] The reader may readily agree but is likely to slip immediately into ways of thinking characteristic of old-fashioned psychology with its vestiges of non-natural or super-natural 'minds' or 'faculties' or its modern *ersatz*, the 'brain,' 'cortex' and other magic spots.

These subtle conditions may make for the 'formality' or 'informality' of an occasion. For example, whether a given behavioral event (two senators talking) occurs on the floor of the Senate or at a bar will be important in its understanding, interpretation, or prediction. Long ago Pavlov found that his expriments with dogs were ruined when the only change in the laboratory setting was a fly buzzing across the room. It is these so-called 'extraneous' factors that modern experimentalists attempt to bring under control in order to achieve a greater degree of prediction of the behavior under observation.

Besides the organism and stimulus object and the setting or situational factors, one must also include the 'medium of contact' or condition that permits the organism and stimulus object to come into a psychological relationship. Obviously, without light 'visual responses' will be impossible, and one cannot hear without a medium of air as is illustrated by the well-known physics experiment of ringing a door bell in a 'vacuum.'

Although our description seems complicated enough at this point, it reaches even greater complexity, for a striking characteristic of behavioral events, and one that permits their chief differentiation from biological and physical [8] data, is their *historical* character. It is only the *successive* 'contacts' between the organism and stimulus object that permits us to understand why the same object (e.g., a book) stimulates the same child differently at different times or different children in the same way. It is through these succession of events that objects take on a 'stimulus function.' A psychological 'stimulus' is thus a functional and relativistic action.

At birth, the infant performs no such reactions as reading, writing, speaking, playing, etc. Psychologically speaking, we may say that he is at a zero point relative to such behavior, but it is important to note that the human infant is born into a socio-cultural environment at a certain date, *i.e.*, at a given stage of evolution ('time-binding'). Thus, the opportunities for behavior acquisition cannot be the same for Smith_x^{1796} as for Smith_y^{1946} nor for $\text{Smith}_x^{\text{Monday}}$ as for $\text{Smith}_x^{\text{Tuesday}}$. From this point on, one must insist upon a most rigorous 'indexing' and 'dating,' for each stimulus-response unit bears a definite relationship to every other in a series reaching astronomical proportions during any given individual's life time. It is under the slow and cumulative influence of his human environment that the child gradually builds up 'responses' to the persons and things in his milieu.

In this connection, students of language have shown that the infant has a range of sounds prevalent in all the languages, but out of the variety of his vocalizations only certain sounds become selected and rewarded. These become built up into the language of his group while the others drop out to be re-acquired, if at all, only with great difficulty should he learn another language requiring other sounds in later life. So also for the slashing movements of arms and legs which gradually pass from gross, uncoordinated to delicately coordinated reaching, manipulating, writing, ritualistic, drafting, praying, surgical, etc., acts and walking to hopping, skipping, jumping, skating, dancing, acrobatic, etc. The same holds for the individual's beliefs, attitudes, prejudices, skills, manner of thinking, etc. Thus, 'personality,' or the sum total of his responses—all that he does do and can do

[8] The term, 'physical' is used consistently here as the adjectival form of 'physics,' the scientific discipline, and not as the traditional opposite of the philosophically-derived 'spiritual.'

(although *not* doing so at a given moment) is a label for a given point in a connected series of events involving $Smith_1$. 'Personality,' studied at a given instant, makes no sense, but once the 'space-time' factors are sufficiently expanded, one sees a coherent series of events—a 'chain reaction' or multi-dimensional relationship of factors—that gives understanding and permits prediction and control of behavior. Incidentally, this has been essentially the approach of such modern psychiatrists as Adolf Meyer and C. Macfie Campbell in understanding the behavior problems of their patients.

If all of the individual's behavior is the result of an acquisition of a multitude of 'responses' throughout his 'reactional biography,' there is no necessity of such traditionally accepted entities as 'innate capacities, talents, intelligence,' etc., because in each case we can trace out the zero point, the slow beginnings, and gradual evolution of the performances traditionally labelled in this way. The work of interpreting behavior is here fact-oriented or operational. One starts in the 'natural order'—facts first, then finds precise terms to describe them rather than by imposing culturally-derived terms upon the facts. This is of great benefit if for no other reason than by its elimination of many pseudo-problems that are only verbally created.

As a matter of fact, field observations support the above assertion. For example, we find a Beethoven already working assidously at the violin by the age of three. Our Mozarts, Chopins, and Paderewskis show a persistent and complex history with musical objects and persons. Adequately described, such explanations would have to include factors of a hygienic, economic, cultural, technological, parental and inter-personal sort as well as a host of other inter-related conditions. To quote another illustration, we observe that Joseph Conrad, who up to the age of twenty-one had no psychological history with English language stimuli but who from that time on immersed himself in such stimuli, in time built up literary behavior which caused him to be labelled a master of the short story among *English* writers. Note, too, the story of Helen Keller who was gradually 'slipping into feeblemindedness' (*i.e.*, she was failing to build up behavior). Her uncle recommended her admission to a feebleminded institution but the mother did not give up so easily and instead hired a teacher who constantly stimulated the child in the only remaining way, through the skin. That she gradually built up complicated speaking, writing and creative behavior is well known. For further examples let the reader study himself both as regards his deficiencies and his excellences.

The foregoing sketch of an objective psychological approach differs in many respects from older and current elementalistic systems. The objective psychologist derives explanatory principles that stem directly from the observed events and are always directly referable to them. There is no necessary assumption of an intermediating agent and therefore no gap between crude datum and construction. Behavior is not assumed to be a 'manifestation' of the nervous system. Neural tissue is active as is other tissue *when* there is a behavioral event, i.e., it is a *participating* factor since the behaving organism is at the same time a living thing, but neural action is not considered as being 'causal' or *basic* to behavior since it is only one element of the total behavioral event. It is well known today that there is *always* neural activity as long as the animal is alive. To presume that there is nervous system action only when

there is a 'stimulus' would be contrary to facts. Furthermore, to attribute 'psychological functioning' to the nervous system would constitute unsound scientific methodology because it would attempt to explain a complex field event in terms of only one part (i.e., the nervous system) of one unit (the organism) of the multi-dimensional totality. The reader will note that such procedure constitutes seeking a 'cause' for an organism's action within itself (self-caused action). Moreover, such procedure would attribute hypothetical functions to the nervous tissue that neurologists have never observed. On this point the American neuro-surgeon, Harvey Cushing,[4] remarks as follows:

> Being obliged because of his hazardous tasks to keep his feet on the ground, the neuro-surgeon is very much puzzled about the mind, which in all his exploring he has never been able satisfactorily to locate, much less feel or see even in the left hemisphere where it is reported to abide.

Similarly Sir Charles Sherrington,[5] who himself believes in correlating psychological with neural action, nevertheless realizes that such localization was never justified by scientific investigation, for he writes:

> But indeed, what right have we to conjoin mental experience with physiological? No scientific right; only the right of what Keats with that superlative Shakespearean gift of his dubbed 'busy common sense . . .' Science, nobly, declines as proof anything but complete proof; but common sense, pressed for time, accepts and acts on acceptance.

Clinical evidence adds further support to the non-elementalistic theory elaborated earlier in the present paper. A report by Rowe[6] describes the case of a white female, aged 38. After a first operation, in which 'most of the right hemisphere was removed,' a second and third operation were performed and the 'entire right hemisphere with the exception of the basal ganglia was removed.' The patient was at first completely paralyzed on the left side for a period of seven weeks, at which time she began to walk and found that she was recovering her walking coordinations. Hearing was normal on both sides!

> Eight months after operation the patient has made some further gains. The strength in her left leg has improved sufficiently to enable her to discard the brace and still get about the house easily and take a short walk daily. The patient's mental attitude is considerably improved. She is quite optimistic and cheerful and has a far better emotional control so that the outbursts of weeping which formerly troubled her, now occur very rarely. She has begun to read books with more enjoyment and seems to have less difficulty with her memory . . . As measured by the Stanford-Binet tests, she still is in the superior adult group, with an intelligence quotient essentially the same as that found on the examination one year before.

In addition, several studies of bilateral frontal lobe lesions are available. Ackerly studied carefully the psychic changes operated upon by Spurling—a woman whose left frontal lobe was severely compressed by a large mid-line

[4] H. Cushing, *The Medical Career and other Papers*. Boston: Little, Brown & Co., 1940.

[5] C. S. Sherrington, *The Brain and its Mechanism*. Cambridge, England: University Press, 1933.

[6] S. N. Rowe, 'Mental Changes Following the Removal of the Right Cerebral Hemisphere for Brain Tumor.' *American Journal of Psychiatry*, 1937, 605-614.

meningioma, and whose right frontal lobe was removed to permit the extirpation of the lesion. In this case, two years after operation there was no significant diminution of intelligence, no disturbance in the emotions, or in general behavior, except a certain lack of distractibility, or tendency to an increased concentration upon the task at hand.

That the foregoing are not isolated cases is shown by the following statement of Dandy,[7] who writes:

> It is possible to remove all the right cerebral hemisphere above the basal ganglia with no appreciable disturbance of mentality; this procedure has been carried out on several occasions for the removal of extensive tumors in the right hemisphere.
>
> On one occasion both frontal lobes have been completely extirpated for the treatment of a bilateral frontal brain tumor and following this there has been no appreciable disturbance of mentality. The patient is perfectly oriented as to time, place, and person; the memory unimpaired; he reads, writes, and conducts mathematical tests accurately; his conversation is seemingly perfectly normal.

The defender of the neural dogma usually argues that, perhaps, the *remaining* tissues 'take over' in such cases as the above. The answer is that since we don't know what actually goes on in the nervous system, one can say practically anything one likes, but this is only an 'appeal to ignorance to save a weakened theory.'

It may be pertinent to conclude with a quotation from Skinner[8] upon the alleged explanator role of the nervous system. This investigator writes:

> The clinical practice of looking into the organism is carried over in the widespread belief that neurological facts somehow *illuminate* behavior . . . If there is any illumination at all, it is in the other direction. Behavior is by far the most easily observed of the two subject matters and the existence of an intermediate science dealing with a conceptual nervous system testifies to the importance of inferences from behavior in neurology. In any event, I venture to assert that no fact of the nervous system has as yet ever told anyone anything new about behavior, and from the point of view of a descriptive science that is the only criterion to be taken into account.

The present sketch of the foundations of an objective psychology does not purport to do more than to furnish a framework for the further observation and interpretation of behavioral data. Contrary to traditional psychology, it does not regard behavior as being either in part or in whole non-natural or anti-natural. Instead it treats psychological facts as natural phenomena that consist of historically-connected events, the central factors of which are the organism and stimulus object in *joint* interaction under certain conditions of interactional setting and media of contact. Such a field theory has the advantage of avoiding troublesome cause-effect theory as well as the old 'power-in-a-spot' theory that loads (verbally) certain parts of the organism with special explanatory powers (brain grooves, engrams, traces, and other effects). Finally, such a point of view rests upon a rigorous operational or extensional analysis rather than intensional definition.

[7] W. E. Dandy, 'Section on the Brain in D. Lewis.' *Practice of Surgery*, Vol. XII (1932).

[8] B. F. Skinner, *The Behavior of Organisms*. New York: D. Appleton-Century, 1938.

✯ BOOK REVIEWS ✯

How Plain is 'Plain'?

THE ART OF PLAIN TALK, by Rudolf Flesch. New York: Harper and Brothers. 210 pp. $2.50.

HOW TO READ BETTER AND FASTER, by Norman Lewis. New York: Thomas Y. Crowell. 319 pp. $2.50.

Rudolf Flesch achieved sudden fame several years ago by reducing a 'complicated,' 7-line OPA definition of 'ultimate consumer' to: 'Ultimate consumers are people who buy eggs to eat them.' For nearly three years, Guerin, my good yeoman, duplicated this performance every day. Yet, as far as I know, he never got his name in the papers because of it.

'This is a book on plain talk. It tells you how to speak and write so that people understand what you mean.' Thus, with the undefined terms, 'plain' and 'understand,' Flesch sets forth on an adventure into the world of words. It seems to me that a book on 'plain' talk should demonstrate some by first of all coming to grips with questions like these: What *is* talk when it is 'plain?' What does 'plain' talk make 'plain' and for whom? What does Mr. X do when he 'understands' 'plain' talk? What are the specific reactions of Mr. X on the basis of which two observers, after watching him independently, will agree on whether or not a bit of talk is 'plain' to him and on whether or not Mr. X 'understands' it? But in two hundred pages, there is no indication that these undefined terms suggest any questions to the author at all.

'There is nothing more important to you as a speaker and writer than that your audience understand you; and on just this point you can never be sure. You are forever guessing. This is unfortunate . . . . As long as you are just guessing (*sic!*), you have no way of knowing whether your guess was good or bad, and whether you are getting better or worse.'

With a barrage of words that ring with self-assurance and certainty, Flesch, in staccato sentences (average length: 18 words), demolishes 'guess work' after only 58 pages which contain 'only advice that is based on scientific evidence' (he goes all out for 'science'), by teaching you 'to guess the exact degree of difficulty of what you are reading or writing.' If you follow his advice, 'you can be certain that people will understand you better; . . . . most of the mathematics have been worked out for you in the tables in the back of the book, so that all you have to do is some simple adding and subtracting.'

To achieve this 'scientific' miracle:

1. Avoid affixes
2. Throw out articles (a, an, the)
3. Get rid of empty words (prepositions, conjunctions, adverbs)
4. Stick to subject—predicate—object order
5. Pack 'heavy' stuff with lots of ex-

celsior ('It's as simple as that.')
6. Write short sentences
7. Prefer the 'familiar' word to the 'far-fetched'
8. Prefer 'concrete' words to the 'abstract'
9. Use verbs
10. Use 'homely,' 'simple' language (for which the author hopes 'your mouth waters . . . . as it would for a nice chunk of Grandmother's oven-baked, brown bread')
11. Remember that, 'people talk plainly as long as they don't think about it'
12. Ask: How would the Chinese say it?
13. 'Talk so any schoolboy can understand what you say'
14. Use the 'yardstick'

and practice numerous other 'secrets,' from which several hundred pages of 'plain' talk do not remove the veil of secrecy for me.

Like Eddie Bergen, Flesch creates a Charlie McCarthy—the 'yardstick.' Unlike Bergen, he then forgets that Charlie can say only what Bergen says. The yardstick comes to life, and is immediately deserted by its father. From the moment of its birth, it walks on its own feet. Assurances that it is a 'scientific' yardstick somehow fail to assure.

Here is how to use the 'stick.' 'First, take the average length of the sentences and multiply it by .1338 (you can look this up on page 202). Then, take the number of affixes per 100 words and multiply it by .0645 (for this you use page 203). Add these two figures. Next, multiply the number of personal references in 100 words by .0659 (worked out on page 204) and subtract the result from the sum of the first two figures. Finally, subtract .75. The result is your difficulty score, which is apt to be a figure between 0 and 7. Here is what it means. (Very easy: below 1; Easy: 1 to 2, etc.).

With matters reduced to such 'simple' terms, it appears that all that is needed now is a Rube Goldberg invention to make the whole job completely automatic.

I suggest that *The Art of Plain Talk* could be made even more 'scientific' if the author would unveil at least two additional 'secrets':

1. The sound of the yardstick's voice. A phonograph record would convince the skeptical.

2. A yardstick that would speak 'plainly' and 'simply' (and without prompting by a Bergen) about what Smith_1 does with the 'plain' talk that comes his way.

These suggestions are not meant to be frivolous, and they cannot be laughed off (to use colloquial prose, as Flesch suggests), as recent events in Germany have shown. What Schmidt_1, Schmidt_2, etc., did with short, 'simple' sentences (*e.g.*, Deutschland Erwache!) turned out to be not so 'simple'—even to the manufacturers of the 'plain' talk. I cannot understand how a supposedly 'scientific' treatment of language can ignore such elementary considerations.

The author correctly recognizes that problems of *producing* talk and writing are similar; however, he identifies few of the problems. There is no treatment of order, relations, structure, additivity, elementalism, non-identity, assumptions, undefined terms, structure of language, predictability, etc. It would seem that a book of advice for those engaged in talking or writing to their fellow citizens about what is in the universe would consider such issues, which appear, on careful analysis, to be not so 'simple.' They cannot be 'plain-talked' or 'Dale Carnegied' out of existence.

I agree that punctuation marks can

help make it easier to evaluate what an author has represented with ink marks. I believe, too, that communications can be improved by the elimination of involved grammatical constructions. (However, the 'simple'-by-the-yardstick grammatical construction, *Fire!,* can turn out to have some 'complicated' consequences.) The more frequent use of verbs would probably keep us at lower levels of abstraction in some instances. The author's opposition to the grammarian's horror for the split infinitive cheers me no little. I like his warning against the use of 'Time-style,' adjectives; but he gives no indication that he understands that the signal reactions in a living being make 'Time-style' (or any other 'style,' for that matter) adjectives dangerous. Unless readers in general substitute *conditional* reactions for signal reactions, they have no protection against writers who do not follow Flesch's advice. In a sane society, it should be unnecessary to furnish readers with wet nurses who will point out 'timestyle' adjectives when they are encountered.

Several lines in the book suggest that the author almost understands some of what general semantics could teach him. Example: 'when you simplify science, you will find that . . . . part, however simply stated, will be clear only to the people who have some training in that branch of science.' Proper evaluation of this sentence should immediately have made him suspicious of nearly every page in the book. However, by metamorphosis he changes *himself* into a Charlie McCarthy at this point and generously permits the non-verbal phenomena to speak through him. These phenomena he classifies as 'science' and 'not-science.' Flesch talking —not the phenomena. His classifications appear to keep him from guessing, even vaguely, that both the transmitter and receiver of most verbal statements operate, often unconsciously, under some kind of 'science.'

'Roses are red' implies some 'red' in the flowers. By the 'yardstick,' we have here a short, 'simple' sentence, non-'scientific,' and 'understood' by nearly everyone —but understood incorrectly. Anyone who doubts this is asked to produce some ultra-violet or infra-red by using the brand of 'know' implied in the sentence: that some 'red' is in the flowers.

In: 'Smith is an Aryan,' we have another of those non-'scientific,' by-the-yardstick-'simplicities' that conceals some of the 'science' (L.-*scire:* to know) that buzzes around under the skin of the 'plain' talker and under the skins of many of the receivers of the 'plain' talk. Wrapped up in this 'plain,' non-'scientific' package is some 'know' like the following:

1. There is spontaneous, automatic, not-by-man division of the individuals comprising mankind into absolutely unique classes—races.

2. Within each class, each individual is 'essentially' the same as every other individual.

3. Each individual, no matter in what class, is the same in all essential respects this instant as he was at a given instant yesterday, will be tomorrow, forever, and ever, amen.

4. Etc.

It has been aptly said that 'to know anything, one has to know everything.' Flesch does not consider (except in connection with the 'technical' matters which *he* classifies as 'science') a corollary that can be derived from this quotation: however simply stated, *anything you talk about* will be evaluated correctly only by the people who have adequate training in those aspects of the universe about which you are talking.

I predict that many readers will be im-

pressed by what I call whistling-in-the-dark techniques employed throughout the entire book. For example, in the first eighteen pages I count thirty-six expressions of certainty (average: two per page) like the following: 'you can make sure, without doubt'; 'if a scientific fact has been verified once, it may be used anywhere' (*sic!*); 'both of you know what you are talking about'; etc.

The author would be more convincing if he had taken more of his own medicine. He says, 'the commenting adjective is hostile to and literally [*sic*] kills the following noun.' Commenting adverbs also 'raise havoc with sentences.' Is he talking about the 'plain' in plain talk? In 20 minutes skimming, I found 50 examples like these (italics mine): *'sound* and *practical* rules'; *'terse clear, picturesque* talk'; *'standardized, prefabricated, functionally-designed* parts'; *'essential* meaning'; *'precise* meaning'; *'abstract* meaning.' I am convinced that some 'commenting' adjectives do raise hell with the following nouns. I am also curious about what a non-'commenting' adjective would look like.

Expressions like: 'as everybody knows,' 'anybody can see that,' etc., are used so frequently that one wonders why the book needed to be written at all. That the author himself is suspicious on this score is suggested by numerous situations where he violates his own rules against adjectives and adverbs only to make confusion worse confounded. Here are some: 'naturally easier to read,' 'really simple language,' 'real nature of unreadability,' 'exact scientific explanation,' 'true brevity,' etc. Are the terms, 'naturally,' 'really,' 'true,' devices for thumping the table at points where the argument is recognized as weak?

This illustration of the 'art' of 'plain' talk will interest students of general semantics: 'those who believe in semantics are fighting against the "tyranny of words" and have denounced *all abstractions* as meaningless fictions . . . . however, . . . we cannot just go ahead and banish all those words (apparently Flesch believes only certain "big" words are abstractions) from our speech, which seems to be the dream of the semanticists.'

I don't know which semanticists are trying to banish abstractions from our speech. *General* semantics classifies *all* words as abstractions and undertakes to teach us to be conscious of abstracting when dealing with words. Wendell Johnson has pointed out (*ETC*, Vol. I, No. 3) that this supposed desire to eliminate all abstractions is part of the naive folklore that is circulated by people who have never bothered to read *Science and Sanity*. This suggests that someone should write a 'plain,' 'simple' book entitled, The Art of *Accurate* Talk.

II

With talk as simple and 'plain' as Flesch would have us produce it, it might seem to some that a book entitled *How to Read Better and Faster* would be excess baggage. But not so.

Norman Lewis, the author, describes himself, according to his publisher, as probably having read more pages in the unabridged dictionary than any other person in captivity. I believe it.

The Lewis volume, too, claims the approval of 'science.' 'Is there any reason for feeling confident that efficient reading can be learned in a short time? There are many reasons—and all of them are backed up by scientific findings, by laboratory results . . . . All this can happen in five weeks . . .'

The efficient 'reader,' among other things, 'reads like the wind: 600 or more words per minute in ordinary . . . articles,

at least 400 to 500 words per minute (generally faster) on very "heavy" stuff.' He 'comprehends instantaneously . . . has few if any "regressions"—immediately grasps the full meaning of a . . . phrase at first sight.' He 'drinks in whole sentences . . . can absorb an average line of print with two or three eye movements.' He 'reads only with his eyes and mind' (pity the blind!) . . . 'is practically deaf when he is reading—his only consciousness is of rapid moving *thoughts*.'

We are told 'reading is partly mental and partly psychological.' Also, *'while reading* the eyes stop moving. When the eyes move, they see nothing—the reader for the smallest fraction of a second is totally blind.'

The sponge (absorption) theory of reading makes the analogy of transferring 1000 marbles from box A to box B 'admirably applicable to reading. You could, if you liked, pick up the marbles one by one.' Result: 'The muscles in your arm and hand would become tired long before you finished.' So Lewis concludes that 'the more you grabbed each time, the sooner you'd be through.' This is all so simple that it becomes obvious that 'if your eyes grab up (*sic!*) "handfuls" of words, you can read like the wind. The more words you absorb in a single fixation, the faster you read . . .'

Then follow forty-odd pages of 'improvement exercises,' which the trainee views through a slotted piece of cardboard. The exercises reduce 'fixations' and 'frequency of eye movements.' One is on 'absorption of two words at each fixation'; another trains for 'reading an inch of words in a single fixation.' Somehow, I can't help wondering what kind of gadget would train a blind man to reduce finger fixations, finger movements, and promote absorption of two words at each fixation.

After the regressions and fixations have been 'fixed' comes the problem of converting 'motor' (lip mover) and 'auditory' (he hears a page of print) readers into 'visual' readers, who do not 'read at all but *absorb*, in the same effortless, unconscious, efficient manner that a dry sponge absorbs water.'

At the end of two weeks, the 'patient's' present reading habits have been analyzed. His grabber-absorber has been reconditioned. Now, an unexpected difficulty arises. After learning (p. 110) that 'the expert reader never sees words,' the patient now discovers that *'a skillful reader must have a larger recognition vocabulary . . . . A poor recognition vocabulary makes completely skillful and efficient reading impossible.'* Lest this appear a trifle confusing, the patient is assured: 'reading builds vocabulary and vocabulary builds reading.' Thus we establish the 'scientific' basis for the famous statement in *Lost Week End:* 'A circle is the perfect geometric figure. It begins no place and it ends no place.'

But fear not. The patient quickly discovers 'by scientific testing, what percentage of a sufficiently strong reading vocabulary he possesses.' The author has discovered *the* 'Five Hundred Most Important Words for Your Reading Vocabulary.' Never mind how Lewis knows what he knows. Here are some of the words: panegyric, jubilant, insouciant, lascivious, nymphomania, obfuscate. Don't let the apparent contradiction between the 'scientific$_1$' interdict against affixes pronounced in *The Art of Plain Talk* and the scientific$_2$' findings of Lewis about *the* 'Five Hundred' obfuscate you. When in doubt, follow the 'sciences.'

Example of the 'scientific' testing to discover whether or not you 'possess' a reading 'vocabulary' sufficiently 'strong':

A panegyric is insulting.

(True or False?)
News of a victory makes us jubilant.
(True or False?)

The patient is not supposed to ask *to whom* the panegyric is 'insulting,' or what it *is* when it is 'insulting.' Don't be too curious about *whose* 'victory,' or about precisely which individuals are made 'jubilant' when 'victory' makes *us* 'jubilant.' You might be 'finicky' and ask what makes us 'jubilant' when *'victory'* makes us 'jubilant.' Then, you could be downright obstreperous and inquire what victory 'makes' us when it 'makes' us *'jubilant.'* All this, however, would no doubt upset the patient's 'fixations' and get him back into those terrible 'regressions' that he learned to avoid in the second week. It would set him back to the point where he would again be 'grabbing' marbles one at a time. Oh, me! Oh, my!

In the fourth week, Lewis lets the patient in on the 'secret' of concentration. The 'concentrator' is adjusted in a few easy lessons by 'sharpening the intellectual curiosity.' In the fifth week, the trainee is equipped with an 'active thinker' and spark plugs. But let Lewis tell it himself:

'Some people . . . limp along on two mental cylinders, even though the other six are there . . . . What is missing? *The spark and interest of desire.* Take an eight-cylinder car. A car's power and ease of performance depend upon the size and the number of its cylinders . . . . The mind works in much the same way. Intellectual curiosity and personal interest are the spark plugs of the mind's cylinders.'

In five weeks, the old jalopy is running 'better and faster.' 'Better' than *what* or 'faster' than *what* we are not told. For two and a half, this is what you buy:

7 exercises for 'getting the point'
14 exercises for 'speed'
19 exercises to improve the 'fixator-regressor-grabber-absorber' and remove 'lip-mover-vocalizer'
5 exercises to tune up 'active thinker'
6 exercises to adjust 'agreement or disagreement' (two-valued orientator)
10 exercises to break in the 'comprehender'

These, with minor adjustments on spark plugs, and various tests (True-False on 30 pages—one page out of every nine in the book) to make sure that your two-valued orientator works automatically, comprise the treatment. In the end, the jalopy is guaranteed to run straight ahead or straight back (True-False) on a verbal highway. What would happen on the curves, hills, skids, and detours of our non-verbal highways is not made clear. There the signal reactions (though 'better and faster') of a well-sparked, eight cylinder mental motor may get the driver into trouble.

Porter Sargent says, 'We have heard a great deal about a "Science of Education." An enormous amount of time has been spent on "educational research." Able, beefy, brainy men have spent endless hours devising puzzles for children to do and timing them on them. All these ideas, of course, developed within the skulls of adults.'

Hogben also has some advice for readers of 'science' stories: 'Exact science, as the term is usually employed, is a misnomer. Science is as exact as it *can* be with the instruments available or *need* be for the uses to which it is put. Otherwise, it is not science, and using mathematical devices does not make it more or less exact.'

Here, in two 'easy' volumes, the reader can sail on Bagdad carpets of words without ever encountering the bumps,

grime, and soot of the world of non-verbal events. I advise taking these two doses of 'scientific' medicine together, for each acts as an antidote to the other, thus illustrating the mathematical principle of cancellation. This simplifies the problem of landing the carpet, for the sailor-reader finds at the end of his journey that he has gone nowhere—he is at precisely the point where he took off.

I hope our next 'scientific' treatment of words will demonstrate, with pictures, how to french-fry them.

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Lessons in Science

THE WAY OF AN INVESTIGATOR, by Walter B. Cannon, M.D., New York: W. W. Norton & Company, 1945. 229 pp. $3.00.

The Way of An Investigator is an autobiographical account based on Dr. Cannon's experiences in laboratory research during his more than forty years in the Harvard Medical School. In this book, published shortly before his death, Dr. Cannon presents aims, methods, problems, and rewards of one who devoted his life to scientific investigation.

Dr. Cannon disposes of his ancestors and his pre-Harvard years in seven pages. His adjustment in Harvard was rapid. 'On coming to Harvard College I was suddenly plunged into the new experience of listening to lectures and being required to take notes. At the first lecture I attended, I happened to sit beside a rather badly battered and very ponderous member of the football team. In my ignorance I turned to him for advice, asking him what to put down in my notebook. He growled back *sotto voce*, "Wait till he says something loud. Put that down." It was not long before I learned that, in spite of such expert testimony, there was a great difference between sound and sense.'

At one time during his undergraduate days, he was attracted toward philosophy. When walking home with William James one afternoon he mentioned this inclination. James turned to him seriously and remarked, 'Don't do it. You will be filling your belly with east wind.' Cannon never knew whether this was a criticism of him or of philosophy, but happily he followed Dr. James' advice.

Dr. Cannon discusses in a stimulating way 'the spirit of adventure' he found in research activities. He gives many useful methodological hints for those who are engaged in research work. Among them he catalogs eight 'ways of going astray': The Error of Untested Assumption, Error of the Incomplete Test, Error of Omitting Control Groups, Error of Faulty Technique, Neglect of Multiple Causes, Error of Unwarranted Conclusions, The Error of Neglected Detail, and heading a research paper with an improper or incomplete title.

Throughout the book, Dr. Cannon selects from his rich and varied experiences interesting and often humorous examples to illustrate his statements. He found that generally students of medicine worked continuously and conscientiously to prepare themselves for their profession. Occasionally though, students came to his attention who would slide along easily and then cram like mad to get through the final examination. He called such students 'long-distance putters.' This designation was suggested to him by the story of the complacent golfer who teed his ball, looked away to the next green, and declared confidently, 'That's good for one long drive and a putt.' He swung his driver, tore up a stretch of sod, and man-

aged to move the ball a few feet off the tee. The caddy then stepped forward, handed him the putter, and suggested, 'Now for a hell of a putt.'

Throughout the book one is impressed over and over again with the many ways in which an understanding of general semantics can be exceedingly useful to medical students and their professors. Dr. Cannon was apparently unfamiliar with general semantics and recent developments in physico-mathematical methodology. But of course, as a competent scientist, he placed great emphasis on extensional rather than intensional ways of evaluating:

> Students of a scientific subject should be impressed with the importance of referring to demonstrable facts rather than to printed declarations. I hope that those who have been under my instruction have become so accustomed to the query, 'What is the evidence?' that they have not forgotten it and never will forget it. Reliance on a textbook inclines a student to refer to the book for justification instead of citing the facts that lie back of his statement. Only by due regard to the facts does he become independent of the author of the book. Furthermore, it is important to learn to discriminate between facts which have been observed and inferences which are drawn from them. Much of the confusion in ordinary thinking and, indeed, a common reason for disputes spring from the failure to recognize this consequential distinction. Considerate men may find that they agree regarding the facts and then may decide to disagree regarding interpretations.

Dr. Cannon has many worth while things to say on the role of intuition or hunches in scientific investigation, on cautions he believed scientists should observe when engaging in controversies with fellow scientists, and on the importance of making science understandable to laymen. He applauds the formation of the Science Writers Association, composed of laymen capable of adequately reporting new scientific discoveries to the public. The necessity of such adequate reporting is illustrated in the story told by Dr. Cannon of what happened when he reported to the American Physiological Society that a strong emotion, such as rage, is attended by an increase of sugar in the blood. The next morning a release from the Associated Press announced the astounding information that 'man is sweetest when angry.' Once a reporter after examining an article describing the stimulating effect of adrenalin on tired muscles, inferred that adrenalin was proven to be a substitute for sleep.

> The results of this surprising announcement were marvelous. Letters poured into the laboratory from all parts of the country, written by persons who could not sleep and wanted adrenalin and also by persons who felt that they slept too much and wanted it to lessen their apparent need. Cartoonists took out their pencils and gave their imagination free play. A new style of sleeping car was pictured with the passengers conversing or playing cards or reading, while the porter, carrying a carafe labeled 'Adrenalin,' announces, 'Fo' A.M., sah! Have yuh adrenalin?' A mattress factory was displayed festooned with cobwebs because the new discovery had put it out of use.

Dr. Cannon earnestly describes the satisfactions that have accompanied his life of scientific research.

> The marvel of beholding for the first time a fresh aspect of nature fascinates

the investigator and, even through privation and struggle and repeated disappointments, the possibility tends to hold him strictly to the search. . . . . Though the scientific explorer has no prospect of becoming rich in the worldly sense, as a result of his labors, he certainly enjoys a rich life. The enthralling pleasures of discovery, the opportunity to do what he would rather do than anything else in the world, the sense of security in his academic position, the freedom for study and investigation, the world-wide friendships, the homage from learned societies, the assurance that his efforts in teaching and seeking have social value—all these satisfactions are his. No man could ask for better recompense.

Dr. Cannon made no attempt to review his physiological research work at the Harvard Medical School. He aimed instead at giving a lucid and chatty description of 'the way of an investigator' and thus produced a book that can have a stimulating effect on students and young research workers and at the same time be both understandable and interesting to the general public.

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The Hydra

MAN AGAINST MYTH, by Barrows Dunham. Boston: Little, Brown, 1947.

The Man is Professor Dunham. The Myth is the collective semantic disturbance of human history. The struggle is not an even one. The poor Myth hasn't a chance against the professor and his allies. As Professor Dunham enumerates these allies of his, one feels that he is in very illustrious company: the revolutionary Nominalists of the Fourteenth Century, who were the first to undermine the fabulous structure of feudal society; Descartes, who 'sapped the main gate'; Kant, who 'exploded the powder magazine'; the Encyclopedists, who pinned the defenders with small arms fire. In his foreword he also expressly gives credit to Spinoza, Hume, and Marx.

Professor Dunham could have acknowledged many others as fellow myth-breakers: Adam Smith, who put the torch to the Mercantile Theory; Mach, who liberated physics by snapping off the 'meta' it was unconsciously carrying around; Freud, who first among men dared launch Socrates' ambitious program;[1] and, of course, Korzybski and his succession, the contemporary writers in general semantics.

One hesitates to take the writer to task for omitting to mention the contributions of particular thinkers, since any exposition of this sort must necessarily be selective. However, one can legitimately object to misrepresentation. It will surprise those who are familiar with the writings of Alfred Korzybski and Stuart Chase that Professor Dunham classifies them as makers instead of breakers of myths. For example, he attributes to the general semanticists (and to a certain extent also to the classical semanticists, Carnap, Wittgenstein, and others) the belief that 'all problems are merely verbal.' Professor Dunham exhibits this queer belief as a myth and semantictists as its adherents.

Now a certain amount of myth-making is almost inevitable in the business of fighting myths. The Myth, against which Professor Dunham continues Man's valiant, herculean struggle, resembles the Hydra, a creature with many heads who grows new ones as old ones are chopped off. Thus Adam Smith, having disposed

[1] 'Know thyself.'

of mercantilism, begat the myth of 'free enterprise'; Kant, who razed the fortress of arbitrary Divine Will, brought forth the Categorical Imperative; Newton, in tackling the same job, built the immense cage of Absolute Space. Therefore, even a general semanticists might, I suppose, drop a myth here and there. But a belief that all problems are merely verbal is NOT one of them.

In repeating the well-worn accusation that semanticists are people who want to cure the world's ills by paging through dictionaries, Professor Dunham himself sets up a rather obnoxious myth analogous to the ones about the 'communists' (Free Love and Moscow Gold), about 'science *vs.* religion' (science can't know *everything:* that's why we've got to have religion), and modern art (who ever saw a rectangular pear?)

Except where Professor Dunham fights friend instead of foe, he performs his task admirably, exhibiting brilliant dialectic virtuosity, which, I suppose, gives connoisseurs keen esthetic pleasure. A marxist approach is strongly evident and is used to the best advantage. Especially convincing is Professor's Dunham's treatment of the philosophies which have served as weapons of class ideology. They are all there, the erudite ones like Spencer's 'survival of the fittest' applied to XIX century economics; the syndicated column varieties, like the platitudes of Glenn Frank; the obscenely rabid ones like the racist 'theories' of the white supremacists. Here one cannot help applauding the author's performance. Books like these are nice, because they give one the feeling that Man still may win. But it is well to keep in mind the analogy with the Hydra. If the appearance of new myths as the old ones are killed is expected, the danger of demoralization is less.

I don't quite recall how Hercules finally did dispatch the creature. But I understand he did not become discouraged at the appearance of new heads, accepted the phenomenon gracefully, and continued with his job.

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Handbook of Persuasion

SPEECH AND HUMAN RELATIONS, by Joseph G. Brin. Boston: Bruce Humphries, Inc., 1946, 163 pp., $2.50.

Speech and Human Relations—now this should be good, one thinks, as he looks at the title of Joseph G. Brin's new book. This reviewer, however, found the title misleading, and the contents disappointing, from the point of view of general semantics.

Professor Brin, who is Director of Speech Counseling at Boston University, has written a helpful handbook for the aspiring public speaker. He deplores too many rules, but at the same time gives numerous suggestions on voice, gesture, posture, use of effective words, and the art of persuasion.

His basic assumption is that the speaker's primary aim is persuasion—that he is, at least for the duration of the speech, a leader and a teacher. He states that 'Public speaking is not a matter of technique alone; clear and precise thinking are first requisites for earnest and forceful speaking.' (p. 18) But he dismisses the whole problem of *understanding* with the statement that 'everyone understands the "language of the street."' (p. 21)

Toward the end of the book he finally comes to the subject, 'What Will You Talk About?' This matter he takes care of in four pages by saying that the speaker must consider the type of audi-

ence he is addressing and choose his subject and style accordingly.

Altogether, Mr. Brin's guidebook seems to be much less concerned with improving human relations than with polishing up the lecturer's style so that he may impress his audience favorably. Granted that the public speaker *is* sincere and intelligent, with a message that *should* persuade his listeners to act or think as he desires, then the author's suggestions will help the speaker achieve his goal.

In a recent *Atlantic Monthly* article (April, 1947) Henry Seidel Canby calls the 1920 and '30s the Diamond Age of lecturing for writers, critics and editors. He said that, in speaking to Americans, 'The British celebrity as a rule made no attempt to interest his audience. He gave good material, usually in a very bad package, and the hearer could unwrap it himself or go home.' One gets the impression that Mr. Brin's book was designed to help just such lecturers.

On the whole, assuming that communication is an interchange of ideas, rather than a one-sided situation in which the speaker persuades while the audience accepts or rejects, Mr. Brin's book leaves the reader feeling that the whole subject of human relations as a dynamic process has been ignored.

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✩ FILM REVIEW ✩

REACTIONS TO FOREIGN FILMS

KARL W. HINKLE

DO AMERICAN audiences see only the 'best' foreign films? Not always. We usually view what international distributors consider 'box office.' Influencing this consideration are matters of censorship, popularity of foreign stars, critical acclaim abroad, and world film trade agreements.

Nevertheless, the imported film likely provides more mature fare than what Hollywood producers consider their 'prestige' screenplays. Generally the importation deals with problems, settings and characters closer to life. Even the farce, musical or fantasy may build solidly on a premise abstracted from life-experience, interpreted by writer and director in ways putting most Hollywood workers to shame.

European productions also assure better fare for what might be called a negative reason. With them deep identification often is discouraged. Met with language difference, unfamiliar custom, scene, school of acting, and slow pace, we tend to act as 'scientific observers.' The very necessity of reading printed dialogue subtitles prompts such action. Greater opportunity for conscious abstracting is allowed. We profit doubly. We begin to study and appreciate nuances of camerawork, scene, editing and acting unnoticed previously. Also we observe cultural similarities and differences and acquire tolerant attitudes towards other peoples.

As through the foreign picture these fresh criteria of screen enjoyment are discovered, we tend to develop a discipline of controlled identification. We identify only when sure that descriptive action of characters in their backgrounds, and inferences and judgments abstracted thereof as major and minor premises, show at least fair life-authenticity.

Soon our discipline is found applicable to motion pictures generally. Gradually we learn to offset the hypnotic lure of a lighted screen in a dark theater, learning to be conscious of abstracting as we watch, making judgments of our own and not always those thrust upon us by the picture.

Repeatedly, however, our discipline may be soundly challenged through the European screenplay, not only on thalamic but higher levels. Here inferences and judgments are formed, and here the relative life-validity of film premise, upon which story is constructed, should be carefully considered. For once proved by character action, the premise becomes a judgment, to be carried away as we wish, often unconsciously.

Sometimes we may accept the premise, but not the characterization-in-setting; or accept the characterization-in-setting but not the premise. Now and then, much more frequently than with the American film, we can accept both. But usually it seems 'safer' to remain conscious of both throughout. Otherwise we may indulge in an unpleasant dramatic dichotomy, if nothing else, as this reviewer will try to

show in terms of his own experience. And more serious problems may arise, as we shall show later.

I

Many of us know Prosper Merimée's story of Carmen, the gypsy girl who, living and loving freely, destroys herself finally through persistent belief in a superstition. The fortune-teller's cards reveal she shall find true affection for one man, then die. This omen drives her to ruin Don Jose's army career by tricking him into turning bandit. Then she persuades him to kill her.

Such intensional orientation as Carmen displays, as Irving J. Lee has noted, provides 'abundant opportunities for dramatic conflict.'[1] It seems no accident that much high-level literature and drama preserves its appeal through such conflict. In it succeeding generations of persons catch glimpses of their own possibilities of misevaluation, learning lessons related to life-problems. Certainly if 'universal' problems exist, one of their bases is found in the broad areas of human misevaluation. *Carmen,* we would believe, might illustrate working out of such a problem, for our benefit.

But in *Carmen,* the film, this reviewer met with a peculiar situation. In Bizet's opera, the story is set to music that most persons find attractive. With the film, music remains mostly in the backround. The director interprets the story through the 'poetic realism' found in the modern French production. This approach does not quite suit what was originally conceived in terms of the romantic French opera stage of the last century. In the opera, we 'participate' in singing, dancing and music, with plot secondary. In the picture the plot is emphasized, and facing the richness of Gallic acting, our discipline fails.

We find ourselves identifying when we know we should not. Although the story seems 'real,' Carmen's personal attitudes not only mock standards of social morality; they baffle common sense. Although taken with her spirited behavior, we cannot accept her extreme self-delusion about her 'fate' as told by the cards.

We then engage in a sort of seesaw of identification and disbelief, possibly a conflicting interplay among thalamic and higher abstraction levels. This indecisiveness, even concerning fictional characters, does not encourage enjoyment of what we have come to see. It also may have further repercussions in our nervous systems.

Another factor may enter here. We admire Vivian Romance's vivacious, intelligent portrayal. Perhaps it is *with her,* rather than with the *characterization by her,* that our sympathies lie. We cannot associate *her as an actress* with having the self-delusion of the character she portrays. This seems a facet of identification yet to be explored.

Still our problem remains. It is one we may avoid, if we so desire, with the Hollywood film of low-level appeal. We walk out on it, or having anticipated its level, we just do not attend. We know that there particularly identification often is more or less forced upon us, under pressure of clichés that, although recognized as such, still set off 'subversive' mechanisms in the nervous system.

But *Carmen* we want to see to the finish. Deeply attracted, shall we continue half-heartedly to remind ourselves of abstracting and indecisively repress our welling feelings, knowing that to do so may cause tension and blockage? Shall we let ourselves go and avoid this situation, later saying 'after all, it was just a story,' although we know that while identifying

[1] *Language Habits in Human Affairs,* New York: Harper Brothers, 1941, p. 202.

we had somewhat perjured ourselves in accepting what was not probable in life-experience?

Here seems a fitting test for our discipline of controlled identification. This reviewer personally forced himself to act as a 'scientific observer' before the show was over. He 'lifted' himself out of the story, and still managed to enjoy himself, working on higher levels. He turned to those other criteria of film appreciation.

This effort, surprisingly—and yet not so surpisingly—did not prove unrewarding. Discipline received an unexepected boost. For just before *Carmen* was written off with 'Fin' a title faded in.

It said something like this: 'When gypsies tell Carmen's story, they remark that she could have avoided tragedy by realizing that her fate did not depend upon superstitious belief but upon her own actions.'

Probably the writer-adapter or director anticipated, with mature eye, our questionable feelings, and wished to warn, or perhaps to apologize. Since this was a well-known story, it was necessary to transcribe it faithfully to celluloid. Perhaps he realized that it reflects attitudes of characterization and premise outgrown today.

This kind of honesty, although in this case lamely after the fact, we do not meet ordinarily in the Hollywood film.

II

While the American screenplay sometimes seems to exhibit a forced or wishful optimism, as in *'It's a Wonderful Life,* or a vitiated moralism as in numerous 'tough guy' thrillers, the French variety ordinarily shows a restrained pessisism. This may be noted even in the comedy, especially if it was made during or since the late war.

Such pessimism seems sort of a cultural judgment, several abstractions beyond the American attitudes. We have not had to meet aristotelian pressures as frequently, nor so long been forced to philosophize about life-conditions as the French. Their group resilience even then we may admire, for other nations in Europe have been driven almost to mass suicide under similar pressures.

Roger Manvell calls this condition revealed in the French film a 'spiritual malaise.'[2] That it could be 'catching' we can easily suspect, especially to individuals liking the Gallic movie, usually those labeled as 'intellectuals' in our American society. Already they may incline to despair of world conditions, largely unaware of the antidote of relativistic attitudes. Despite humanistic treatment of what Manvell calls *'sensibilité,* that quality which reveals with sensitive tenderness and profound feeling the values of goodness and beauty in human beings,'[3] the Gallic production might promote further fatalism.

Such might be suspected of *Children of Paradise.* This reviewer found it laden with figure-symbols of morbidity and frustration. Identification with these is not to be shrugged off easily, for high-level acting, authenticity of setting and poetic dialogue, among other factors, make the picture very believable. We can see obviously why it appears 'decadent with a helpless fatalism,' as Manvell would say.[4] It was produced during the German occupation. Writer Jacques Prévert and director Marcel Carné could have little to cheer them. Moreover, fear

[2] *Film,* Penquin Books, Ltd., 1946, p. 185. This 'pocket book,' costing only 35 cents, is packed with useful facts and figures regarding the world film industry. It also offers some rather discerning criticism.

[3] *Ibid.,* p. 186.

[4] *Op. cit.,* p. 186.

of Nazi policy could have prompted use of 'allegorical symbolism' found profusely by some critics in the film. Such symbolism, if we desire, may be regarded as 'cover up' for two men's interpretations of humanity's dilemma. But having seen their pre-war productions, like *Hotel du Nord,* we can judge there was little healthy optimism found in the pair to begin with.

Children of Paradise concerns the intertwined lives of a group of persons in the theater district of Paris during the 1840's. Chief character is a Pierrot-like mime, played by Jean-Louis Barrault, with a sensitiveness often akin to Chaplin's. The mime falls in love with the mistress of a criminal gang leader. The characterization of this woman, by Arletty, seems to idealize the *demimondaine* who passes from man to man with sweet resignation. The mime loses her to a fellow actor. He marries an actress who bears him two children. He becomes a famous pantomimist. Meanwhile he mourns his lost love, who since has become mistress of a count. The mime then learns this woman still admires him from the theater box. So does the wife, who sends her little boy to the box to plead touchingly against resumption of this smouldering romance.

We see a round-robin of tragedy. The gang-leader, perhaps jealous of the count more for his position than anything else, kills him in his bath. He calmly awaits the police, delighted with the magnitude of his *coup*. We sense also that he is relieved to be 'purged' at last by a retributive society. The mime wants his old love to return, willing to throw aside family responsibilities. She flees him when confronted by his pleadings and disappears into the carnival crowds in the street. The mime desperately rushes after but loses sight of her as the picture ends.

Every character seems defeated except the faithful wife, and even she suffers some frustration. Yet as sole symbol of fidelity and courage, she is lost in the swirl of dramatic emphasis on weaker but more highlighted figures. We incline to accept their attitudes.

Perhaps most aptly symbolizing the film's premise is a striking scene where the mime, in wild frustration, turns to a dressing room mirror and marks a large 'X' in grease-pencil over his own image. This act gives a feeling of inevitable defeatism. Somehow it signifies the negation of the individual.

This and other acts by the mime, as well as by other characters, we perhaps should not take too seriously. Otherwise we may accept, through uncontrolled identification, what he and others symbolize in terms of premise. We must not forget that *we* make the premise (once proved, a judgment) on what we conclude from character action, inference upon inference, and influenced by attitudes previously conditioned in us. If already subject to 'malaise,' our beliefs might be strengthened or reaffirmed.

Nevertheless the film is highly recommended. Much of it seems close to life. One who is conscious of abstracting will realize, however, that life does not necessarily have to be lived that way. He will not believed that "everyone is frustrated to the point of tragedy' or that 'one always loses what he loves most.' But he will realize extensionally how it feels to look at life from the point of view of such premises.

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JACQUE, CHRISTIAN: *Carmen*
CAPRA, FRANK: *It's a Wonderful Life*
CARNE, MARCEL: *Children of Paradise; Hotel du Nord*

☆ CORRESPONDENCE ☆

Understanding Marx

SIRS: On psychological levels, we have discovered certain relations holding between the functions of the human organism in its environment, and have correlated these functional relations into verbal generalizations or 'laws.' On the basis of these generalizations or 'laws,' we are able to predict (sometimes correctly) the behavior of the human organism under various sets of conditions and thus arrive at some sort of formulation as to what conditions facilitate the most efficient functioning.

The thing to remember is that these 'laws' have been formulated as a result of empirical observation of the behavior of individual human beings. And here arises a vital and fundamental consideration that appears to me to have been missed by most writers I have read—except, perhaps, one. It does not appear to have been generally realised that although these 'laws' describe individual behavior, they mostly become inadequate when applied to the behavior of numbers of individuals 'in the mass' of society, just as laws concerning electronic levels of behavior become inadequate in dealing with the configurations appearing on the level called 'chemistry.' The greater multiplicity and variety of relations involved call for different 'laws' to deal with the 'new phenomena' arising out of these new relations.

To try to make clear what I mean, in the collection of human beings 'in the mass,' each individual exhibits certain behavior arising out of relations he holds within that mass. This behavior has been rather thoroughly investigated and findings formulated by such men as Freud, Jung, Adler, Malinowski, Darwin, etc.

However, there is another behavior exhibited by the mass, *as a mass,* that is not simply the sum-total of individual behaviors. Consequent problems arise which are not simply the sum-total of 'individual problems.' The relations holding within the mass are not additive, but functional, and 'the mass' exhibits characteristics and behavior peculiar to itself as-a-whole. Such considerations seem to me to have been largely neglected by most scientific investigators.

I mentioned an exception—perhaps it would come as a surprise to many—I refer to the much maligned, misunderstood, and misquoted Karl Marx (in fact, he rivals Freud in this regard). To me, Marx appears as the one person who has realized and formulated laws relating to the 'macroscopic,' 'social' level — a different level to the 'microscopic' individual level.

Marx has been accused often of being too 'materialistic,' and of not taking into account the action of the 'mind.' These elementalistic notions become no criticism at all when we apply some semantic disinfecting to them. Introducing *Capital,* G. D. H. Cole says of Marx: 'The mind of man appears to him as a social product and as part of the reality which he contrasts as material with the purely ideal reality of the Hegelians. Much of the prejudice against his doctrine comes from a failure to understand this. Marx's materialism is not materialistic in the sense that it excludes the action of mind, but only in that it seeks its reality in this world of men and things, and not in any

universe of ideas transcending this world and its limitations.'

Our modern non-elementalistic notion, that of the organism as-a-whole-in-its-environment, is very similar to the notion implicit here.

Read what Marx said of his early efforts at grappling with problems in human behavior:

> I was led by my studies to the conclusion that legal relations and the forms of the State could neither be understood by themselves nor be explained by what was called the general 'progress of the human mind,' but were rooted in the material conditions of life. . . . The general conclusion which I reached, and which, once I had reached it, continued to serve as the leading thread of my work, may be summed up briefly as follows: Men, in the social production which they carry on, enter into definite relations which are indispensable and independent of their wills; and these relations correspond to a definite stage in the development of their material powers of production. The sum-total of these relations of production constitutes the economic structure of society—the real foundation on which rise legal and political superstructures and to which definite forms of social consciousness correspond.

Once more discerning general semanticists may see an anticipation of modern scientific notions, the awareness of relations holding between human beings, functionally producing results on grosser levels in the shape of 'social-economic' systems.

Note also, the indication of the awareness that the relations which develop between human beings develop in a way 'indispensable and independent of their wills'; that is, the development is automatic, unconscious—not 'individually' controlled.'

Marx's following words seem to show some awareness of the dynamic process nature of human development. It does not need the evaluating prowess of an Einstein to see the analogous connection of this passage with processes and changes which take place on microscopic levels in 'physical' science.

> The material powers of production in society, at a certain stage of their development, came into conflict with the existing relations of production, or—what is but a legal expression of the same thing—with the property relations within which they were previously at work. These relations of production then turn from forms of development of the powers of production into fetters upon them. Then comes the period of social revolution. With a change in the economic foundation of society the entire immense superstructure is more or less rapidly transformed. . . . No social order ever disappears until all the productive powers for which there is room within it have been developed; and new, higher relations of production never make their appearance until the material conditions of their existence have been developed in the womb of the old society.

This letter can necessarily have done no more than faintly scratch the surface of a field in which there is much room for investigation by general semanticists, who have instruments of much greater precision than Marx had to assist them. Considerations of 'world affairs,' 'social problems,' 'international understanding,' etc., stem from these notions, so, surely, no one may dismiss their importance.

M. EDWARDS
Sydney, N.S.W., Australia

✰ NEWS AND MISCELLANY ✰

Governing Board of the Society

The following were elected to the Governing Board of the Society for General Semantics in the mail elections held last June: *President*: IRVING J. LEE, Ph.D., Assistant Professor of Speech and Chairman of the Department of Public Speaking, Northwestern University; *Vice-President*: RUSSELL W. MEYERS, M.D., Associate Professor of Surgery, State University of Iowa Medical School, and Chairman of the Division of Neuro-Surgery, University Hospitals, Iowa City, Iowa; *Secretary-Treasurer*: KARL G. HAUCH, Investment Department, Mason, Moran and Company, Chicago; *Board Members*: O. R. BONTRAGER, Ph.D., Professor of Education, State Teachers College, California, Pennsylvania; FRANCIS P. CHISHOLM, Ph.D., Professor of English, State Teachers College, River Falls, Wisconsin; CHARLES B. CONGDON, M.D., psychiatrist, 6 N. Michigan Ave., Chicago, Illinois; S. I. HAYAKAWA, Ph.D., Editor, *ETC.: A Review of General Semantics*; WENDELL JOHNSON, Ph.D., Professor of Psychology, State University of Iowa Iowa City, Iowa; ELWOOD MURRAY, Professor of Speech, University of Denver, Denver, Colorado; ANATOL RAPOPORT, Ph.D., Research Associate in Mathematical Biophysics, University of Chicago, Chicago, Illinois; A. C. SPECTORSKY, Story Department, Twentieth Century Fox Film Corporation, Rockefeller Plaza, New York City.

Because so many of the members of the Board reside outside of Chicago, the President has appointed as Advisors to the Board the following members from the Chicago area: CHARLES L. KLUSS, 141 W. Jackson Blvd., Chicago; VICTOR RUBIN, 7710 N. Ashland Ave., Chicago; MR. and MRS. GEORGE A. TAYLOR, 6059 N. Albany Ave., Chicago; REX A. WICKLAND, 748 Hinman Ave., Evanston. It will be the duty of these Advisors to sit in with the Board to help in its deliberations, especially on those occasions when out-of-town members are not able to be present.

Change of Address

All business correspondence (membership inquiries and dues, subscriptions to *ETC.*, orders for back issues, etc.) should henceforth be addressed to the Society for General Semantics, 549 W. Washington Blvd., Chicago 6, Illinois.

All editorial correspondence regarding *ETC.* and Quote$_n$ should be addressed to the Office of the Editors of *ETC.*: Section of Mathematical Biophysics, University of Chicago, Chicago 37, Illinois.

Los Angeles Lecture Series

Professor ELWOOD MURRAY of the University of Denver gave a series of lectures at Fremont University, 2021 W. 3rd St., Los Angeles, from March 17 to 21, under the auspices of the Pasadena and Los Angeles Area Chapters of the Society for General Semantics.

Officers of the Los Angeles Area Chapter are LAURENCE O. ANDERSON, President; RAYMOND H. F. BOOTHE, Secretary; JAMES T. BOYLE, Treasurer; W. R. BOORMAN, Chairman of the Lecture Committee.

Research in Language Behavior

Attention is called to the Conference on the Scientific Problems of Utilization of Sound Recordings for Research, held at the University of Chicago, August 22-24, 1947, under the general direction of Professor HERBERT A. THELEN of the Department of Education, University of Chicago.

'Attempts to use sound recordings as evidence to check or explore ideas about the nature of personality, of classroom dynamics, of group therapy, etc., have led to the formulation of what appear to be some basic scientific questions,' says the call to the Conference. One of the central questions of the Conference was the degree of significance of language behavior, especially in the study of group dynamics and interaction. Another such conference is tentatively planned for May, 1948.

Love and General Semantics

The August issue of *Cosmopolitan* contains a story by a Frank Stevens entitled 'The Last Word.' The subtitle explains, 'HE was a professor of psychology; therefore he knew most of the answers. SHE was a woman; therefore she knew them all.'

She (a student), according to the story, presents him (a young instructor) with a book with the impressive title, 'General Semantics; Neuro-Semantic Mechanisms of Pathogenesis and Their Implications for Prevention and Therapy.' The gift gets her nowhere. Indeed, he sends it back.

The next semester, she tries a different tack. She increases her use of make-up, dresses with great care, sits in the front row, crosses her legs. Results are *much* better.

In spite of the obvious moral of this story, our readers are urged to enter gift subscriptions to *ETC.: A Review of General Semantics* for their friends and for their acquaintances of the opposite sex upon whom they may have amatory designs. (Gift membership, $4; subscription alone, $3.)

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